NUS CORPORATION
A Halliburton Company

169806

FINAL DRAFT
SITE INSPECTION REPORT
CHARLES MUNDT AND SONS
JERSEY CITY, NEW JERSEY

# FIELD INVESTIGATION TEAM ACTIVITIES AT UNCONTROLLED HAZARDOUS SUBSTANCES FACILITIES — ZONE I

NUS CORPORATION
SUPERFUND DIVISION

02-8803-35-SI
REV. NO. 1

# FINAL DRAFT
# SITE INSPECTION REPORT
# CHARLES MUNDT AND SONS
# JERSEY CITY, NEW JERSEY

PREPARED UNDER
TECHNICAL DIRECTIVE DOCUMENT NO. 02-8803-35
CONTRACT NO. 68-01-7346

FOR THE

ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

JULY 14, 1988

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY:

Brian Pedersen
BRIAN PEDERSEN
SITE MANAGER

REVIEWED/APPROVED BY:

Ronald M Naman
RONALD M. NAMAN
FIT OFFICE MANAGER

| | | | |
|---|---|---|---|
| **SITE NAME:** | Charles Mundt and Sons | **EPA ID NO:** | NJD980784615 |
| **ALIAS NAME:** | 498 Johnston Avenue Warehouse | **LATITUDE:** | 40° 43' 04".N |
| **ADDRESS:** | 498 Johnston Avenue<br>Jersey City, Hudson Co., New Jersey | **LONGITUDE:** | 074° 03' 48".W |

## 1.0 SITE SUMMARY

Charles Mundt and Sons is located in Jersey City, Hudson County, New Jersey. The site is in a residential/industrial urban area made up of rectangular city blocks. A warehouse covers the entire 1 acre of the site. The warehouse was used for unauthorized storage of drums containing hazardous substances. Jersey City has a population of 223,532. The northern tip of Bayonne, New Jersey and the southern half of Hoboken, New Jersey, with populations of 65,047 and 42,460, respectively, exist within a 3-mile radius of the site. The topography is flat around the site with a 1 percent slope down to the southeast.

A ridge 800 ft to the west of the site rises 70 ft above the flat area around the site. The ridge is the southern extension of the Palisades cliffs, which begin approximately 1.25 miles north of the site and continue north along the Hudson River. Approximately 1.25 miles east of the site is the Upper Hudson Bay, and approximately 2 miles west of the site is the Hackensack River.

The warehouse is owned by the Fourteen Florence Street Corporation (FFSC), which has leased out the warehouse space since 1978. The warehouse is currently used for storage by Active Express, a freight shipping company.

In the late 1970s, Don Gordon, a real estate agent, leased the warehouse from FFSC to Mike Sylvestry, who stored several hundred drums in the warehouse without the knowledge of FFSC. Mike Sylvestry abandoned the drums in the warehouse. The New Jersey Department of Environmental Protection (NJDEP) was made aware that drums were possibly stored in the warehouse. The NJDEP entered the warehouse in December 1980 and discovered approximately 465 drums there. The drums appeared to be in satisfactory condition. NJDEP sampled eight drums and upon receipt of the laboratory analysis discovered that the drums contained ketone solvents, nitrocellulose lacquer, vinyl, acrylic, and pigments. A Consent Order was issued by NJDEP to FFSC for the removal of the drums. Unable to locate Mr. Sylvestry, the FFSC tracked down the generators of approximately 200 drums. These generators paid for part of the removal costs. The remainder of the drums were removed at the expense of FFSC. On June 7, 1985, an NJDEP inspection revealed that the drums and spilled material had been completely removed.

According to NJDEP reports and the NUS Corporation Region 2 FIT site inspection conducted on April 12, 1988, the hazardous substances were contained by the drums, and some spills from the drums were contained by the concrete floor of the warehouse. No sampling locations were discovered during the Region 2 FIT site inspection. No release into the environment of hazardous substances has occurred from the site. Therefore, there is no concern of any affected media around the site.

Ref. Nos. 1, 2, 3, 4, 5, 6, 8

# 2.0 SITE INSPECTION NARRATIVE

## 2.1 EXISTING ANALYTICAL DATA

The site was sampled by the New Jersey Department of Environmental Protection (NJDEP) in December 1980. During a raid of the warehouse, the NJDEP sampled eight drums to determine if any hazardous wastes were contained in the drums. Sample analysis results indicated that the drums did contain hazardous wastes. A copy of the results was not contained in the background information on the site. However, notes taken during the raid indicated that some drums were labeled MEK (methyl ethyl ketone), and that others appeared to contain paint sludges, solvents, printing inks, solids, and heavy metal sludges.

Ref. Nos. 1, 5

## 2.2 WASTE SOURCE DESCRIPTION

There were no waste sources on site that were observed during the Region 2 FIT April 12, 1988 site inspection. The approximately 465 drums that contained hazardous wastes and were stored on site have been removed, and the material spills have been cleaned up. The drums had been stored in the warehouse on a cement floor. Sampling to determine the existence or nonexistence of hazardous substances on site was determined to be unnecessary.

Ref. Nos. 1, 2, 3, 4

## 2.3 GROUNDWATER ROUTE

Groundwater samples were not collected during the Region 2 FIT April 12, 1988 site inspection. Evaluation of this site revealed no potential for release of hazardous substances via the groundwater route.

The aquifer of concern is the bedrock aquifer made up of red shale. The depth to the bedrock is unknown. The best geologic information on the site was obtained from a 99-ft monitoring well located 1 mile northeast of the site. This well is located in the same geologic formation as the site. The drilling log of the well indicated that no bedrock was encountered. The log indicates that at a depth of 95 ft begins a layer of at least 4 ft of diabase, which is an impermeable crystalline rock. The diabase is a portion of the formation that makes up the Palisades relief, which emerges 1 mile north of the site. The diabase is overlain by the unconsolidated layer consisting chiefly of red and gray clay with several intervals of 1- and 2- foot layers of sand and small gravel. The permeability of the least permeable layer between the ground surface and the aquifer of concern is less than $10^{-7}$ cm/sec.

The depth to the water table is unknown. There are no records of measurements taken for any wells in Jersey City. Groundwater is not used within a 3-mile radius because of the limited yield of the formations and the poor quality of groundwater.

There are no potable wells located within 3 miles of the site. Within this distance, there are no irrigation or industrial wells that are used.

There is no potential for groundwater contamination from the waste sources that were present on the site. The drums that contained hazardous substances on site were contained by the concrete floor of the warehouse.

The area of Jersey City, New Jersey has a normal annual precipitation of 44 in. and a mean annual lake evaporation of 32 in. resulting in an annual net precipitation of 12 in.

Ref. Nos. 2, 9,10,11,12,13, 14

## 2.4 SURFACE WATER ROUTE

No surface water, sediment, or soil sampling was performed during the Region 2 FIT April 12, 1988 site inspection. Evaluation of this site revealed no potential for release of hazardous substances via the surface water route.

The site is located in an urban business/residential area surrounded by city streets. The entire site is covered by a warehouse. The facility slope is 1 percent downward to the southeast.

There is no downslope surface water that is affected by runoff from the site. The surface runoff from the site enters the street and drains into the city sewer system, with a small percentage of runoff percolating into the soil through the narrow patches of exposed ground that border the front and one side of the building. The 1-year 24-hour rainfall is approximately 2.6 - 2.9 in.

The drum storage area was inside the warehouse on a cement floor. All spills from the drums were contained on the cement floor.

There are no wetlands or critical habitats of Federally endangered species within 1 mile of the site. There is no potential for surface water contamination from any waste sources that were on site.

Ref. Nos. 2, 4, 6, 7, 13, 15

## 2.5 AIR ROUTE

No readings above background were detected in the ambient air on the Organic Vapor Analyzer (OVA) or the HNu photoionization detector (HNu) air monitoring instruments during the site inspection conducted on April 12, 1988.

Readings above background were detected on the OVA but not the HNu from the floor drain in the loading bay of the warehouse. This floor drain is interconnected with the drain of the trucking company located next door. It is believed that the source of the readings is from wash water that occasionally backs up from the trucking company into the floor drain of the Charles Mundt and Sons warehouse.

Readings above background were detected on the HNu but not the OVA from the brick walls of the warehouse. These walls are peeling paint and appear to be very old. Readings detected on the HNu and not on the OVA would possibly indicate an inorganic source of the readings. The source of the readings from the walls in the warehouse is unknown.

There are no historical landmarks that are within view of the site.

Ref. No. 2

## 2.6 ACTUAL HAZARDOUS CONDITIONS

Currently no hazardous conditions exist on site.

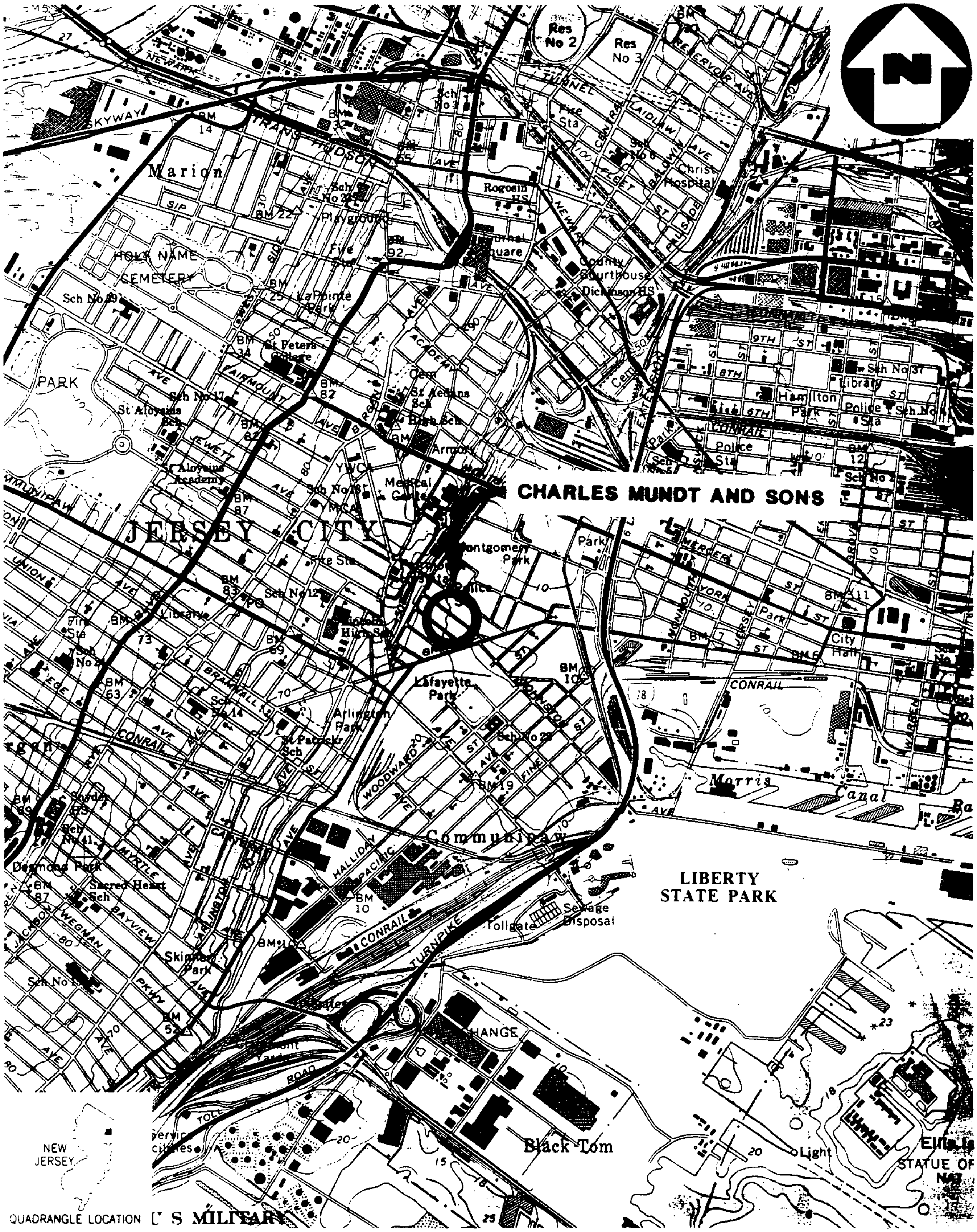
Ref. Nos. 1, 2, 4

# 3.0 MAPS AND PHOTOS

CHARLES MUNDT AND SONS
JERSEY CITY, NEW JERSEY

Figure 1: Site Location Map
Figure 2: Site Map

Photographs are not available from the site inspection.

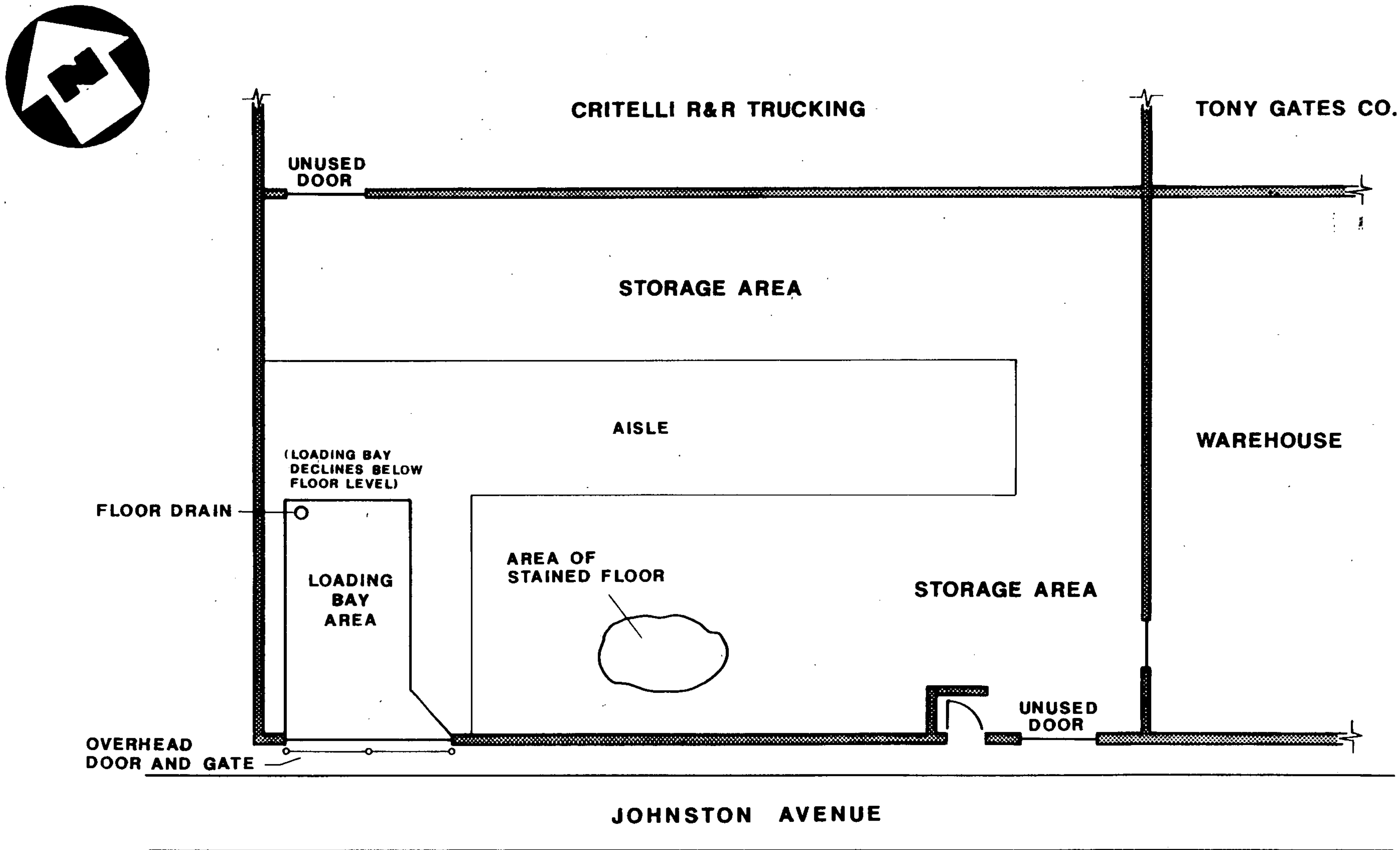



(QUAD)JERSEY CITY, N.J.

**FIGURE 1**

## SITE LOCATION MAP
## CHARLES MUNDT AND SONS, JERSEY CITY, N.J.

**SCALE:1" = 2000'**




**SITE MAP**

**CHARLES MUNDT AND SONS, JERSEY CITY, N.J.**

(NOT TO SCALE)

**FIGURE 2**

NUS CORPORATION

02-8803-35-SI
Rev. No. 1

# 4.0 ANALYTICAL DATA

No samples were collected during the NUS Corporation Region 2 FIT site inspection; therefore, no analytical data are available for the site.

Ref. No. 2

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

There is no contamination route of major concern for the Charles Mundt and Sons warehouse site. The hazardous substances that were on site were adequately contained by the concrete floor of the warehouse. There are no targets for the groundwater or surface water routes. No observed air release was detected during the NUS Corporation Region 2 FIT site inspection. A remedial action has been performed at the site that removed all of the drums containing hazardous substances; therefore, the Fire and Explosion and Direct Contact threats have been eliminated.

On the basis of the preceeding information, it is recommended that no further remedial action be conducted regarding this site.

# 6.0 REFERENCES

1. NJDEP memorandum from Karl J. Delaney to NJDEP Spill File, Subject: Warehouse-498 Johnson Avenue, Jersey City OHSC #80-12-05-008. December 16, 1980.

2. Field notebook No. 0219, Charles Mundt and Sons, TDD No. 02-8803-35, Site Inspection, NUS Corp. Region 2 FIT, Edison, New Jersey, April 12, 1988.

3. NJDEP Administrative Consent Order: Fourteen Florence Street Corporation, June 15, 1981.

4. NJDEP memorandum from D. Dawson to NJDEP file, Subject: Johnston Avenue Warehouse inspection. June 12, 1985.

5. Letter from Michael P. Feltman of Rosner and Feltman, Counsellors at Law, to Barbara M. Greer, Office of Enforcement, NJDEP. February 17, 1982.

6. U.S. Department of the Interior, Geological Survey Topographic Map, 7.5 minute series, "Jersey City Quadrangle, NJ-NY", 1967, revised 1981.

7. Endangered and Threatened Wildlife and Plants. 50 CFR 17.11, 17.12, April 10, 1987.

8. N.J. Department of Labor, Division of Planning and Research, Office of Demographic and Economic Analysis. Population Estimates for New Jersey, July 1, 1982. Published September 1983.

9. Miller, David W. The New Jersey Ground-Water Situation. Geraghty and Miller, Inc., August, 1979.

10. Broughton, John G., James F. Davis, and John H. Johnsen. Geology and Mineral Resources of the Middle and Lower Hudson River Valley. Hudson River Valley Commission, New York State Museum and Science Service, Geological Survey, 1966.

11. Lewis, J. Volney and Henry B. Kummel. Geologic Map of New Jersey. Atlas Sheet No. 40. New Jersey Department of Conservation and Economic Development (NJDCED), 1910-1912, revised 1931, 1950.

12. NJDCED, Division of Water Policy and Supply, Well Record of test well at Kenmore Metals Corp., 380 Ninth Street, Jersey City, New Jersey by Artesian Well and Equipment Co., Inc. December 16, 1952.

13. Telecon Note: Conversation between Javier Delrio, Engineer, City of Jersey City, and Brian Pedersen, NUS Corp., May 12, 1988.

14. Climatic Atlas of the United States. U.S. Department of Commerce, National Climatic Center, Ashville, NC, 1979.

15. Rainfall Frequency Atlas of the United States. Technical Paper No. 40. U.S. Department of Commerce. Washington, D.C., U.S. Government Printing Office, 1963.

REFERENCE NO. 1

ADM-012

**MEMO**

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO Spill File

FROM Karl J. Delaney DATE December 16, 1980

SUBJECT Warehouse - 498 Johnson Avenue, Jersey City OHSC# 80-12-05-008

At approximately 1630 hours on December 5, 1980 Tom Allen, Bureau chief - Spill Response, received a telephone call from Criminal Justice requesting O.H.S.C. involvement in a proposed raid that evening. The target of the raid was to be a warehouse located at 498 Johnson Avenue in Jersey City, New Jersey. The warehouse was alleged to be the illegal storage site of 400 to 500 drums of hazardous materials which had been there for approximately two years and were reportedly going to be moved in the near future.

Gary Allen, George Weiss, and Karl Delaney volunteered to participate in the raid for the purpose of preliminary material classification and material sampling. O.H.S.C. personnel departed Yardville at 1800 hours for a 1900 hour rendezvous in Bayonne with representatives of the N.J. Attorney Generals Office.

The operational timetable was as follows:

1900 hours - rendezvous with D.A.G.'s in Bayonne, Paul Giardina, Directer OHSC and F.B.I. personnel were also on scene.
1925 hours - departed Bayonne for Jersey City

2000 hours - Arrived Jersey City - Criminal Justice personnel proceeded to warehouse in question while O.H.S.C. personnel awaited signal to proceed once all opposition was neutralized;

2015 hours - No opposition encountered, warehouse door breached. Criminal Justice personnel enter building;

2017 hours - G. Allen and Wayne Howitz of Hazardous Waste enter building to make a preliminary hazard determination of the material.

2025 hours - Jersey City Fire Department arrived on scene to provide support in case of fire;

2030 hours- Jersey City Ambulance Squad (requested by O.H.S.C.) arrives on scene;

2031 hours- Paul Giardina advises all N.J.D.E.P. personnel of high homicide rate in warehouse district and suggests that everyone remain in warehouse vicinity;

2035 hours- G. Allen advises that some drums are labeled MEK, others appear to be paint sludges, solvents, printing inks, solids, and heavy metal sludges;

2040 hours- G. Allen, G. Weiss, K. Delaney, Tom Brady, W. Howitz enter warehouse to sample drums at direction of Criminal Justice. This was done wearing Tyvex suits, boots, neoprene gloves, and vapor masks. Glass rods were used to obtain liquid from drums for transfer to sample bottles.

2245 hours - Sampling secured, 8 samples obtained and turned over to Gary Allen for transportation to NJSDH laboratories for [illegible]

2255 hours- K. Delaney and G. Allen [illegible] observed by G. Allen during this inspection. This sample was obtained from a green ring top drum whose oil contents were encased in a plastic bag, no drum markings;

12/6/81

0030 hours - Site secured.

0130 hours - Arrived at O.H.S.C in Yardville.

The following personnel participated in the operation:

Paul Giardina - Director Hazard Management
Gary Allen - O.H.S.C.
George Weiss - O.H.S.C.
Karl Delaney - O.H.S.C.
Wayne Howitz - Hazardous Waste
Tom Brady - Hazardous Waste
Tom Flanagan - Criminal Justice
Greg Sakowicz - Criminal Justice
Vince Matulewich - Criminal Justice
Bill Comfey - Criminal Justice
Jim Tellish - Criminal Justice
Craig Perilli - Criminal Justice
Margaret Foti - Criminal Justice
Ken Blakenbueller - F.B.I.

During the inspection of 12/5/80 the following observation were made:

1) no drum leakage - liquid on drums appears to be a result of the poor state of the warehouse roof.

2) The majority of drums were in satisfactory condition and considering that the warehouse is secure, the threat of vandalism is very low.

3) The drums bear no reliable markings as to their contents, some of which are solid, others liquid.

4) The large 10K gallon tank located in the main drum storage area contians a powdery, white, highly alkaline (pH 11) material, no liquid.

5) The drums are arranged in 30 rows of 10 to 15 drums per row with aisles located between them, apparently to allow access.

REFERENCE NO. 2

# NUS CORPORATION

**II**

0219

Charles Mundt + Sons 02-8803-35



## Table of Contents

4/12/88



Randy Rice 4/14/88

Brian Pedersen 4/14/88

Charles Mundt and Sons
Jersey City, NJ

02-8803-35
4/12/88

NUS personnel present;

| | |
|---|---|
| Brian Pedersen | Site Manager |
| Randy Rice | SSO |
| Rich Pagano | Back-up, decon |

Weather conditions:
at 0945 60°F, Sunny with some clouds, slight wind from Southwest

Arrive on-site at 0945

0949 R. Rice and R. Pagano setting up decon area on sidewalk in front of Charles Mundt building

0955 B. Pedersen walks to warehouse door to look for person in charge. Mike Aragona 433-0293 is ~~the~~ the person in charge of warehouse operation. B. Pedersen calls him to check the access arrangements. He has not been told by Jerry Mecca of the site inspection and said that he will call J. Mecca to check. ~~with~~

1005 Mike Aragona from Active Express called back and gave permission to enter.

Randy Rice 4/14/88

B. Pedersen
4/12/88

Charles Mundt + Sons 2-5803-35

1007 R. Rice and B. Pedersen getting ready in Level B for site recon

1020 RR and BP ready for recon. Ready to enter building

Talking with fork lift operator John. 3 years here

1023 R. Rice on the air
BP, on air
Entering building.

R. Rice checking drain at bottom of loading dock. Using a trowel to stir up debri's in a 1 1/2 ft diameter drainage hole.
Getting 100 ppm on OVA, nothing on HNu, after disturbing with trowel.
Checking front on building along where John said the drums were stored

OVA flamed out.
Relit the flame. Reading keeps dropping.

No reading from garbage barrels.

1035 HNu is reading 13 ppm at end of loading dock.
R. Rice goes out the door to check the HNu zero reading.
Zero reading is correct

Brian Pedersen 4/12/88

Randy Rice 4/14/88

(may have been from floor)
Reading on HNu of 18 and then pegged from pallets stacked of "Sachtolith L".
Reading of 6 ppm (HNu) on open bag.
No reading on OVA
Warehouse floor is not stained. It is dirty

Getting around 10 ppm on HNU while walking thru warehouse in breathing.
No reading on OVA
1045 R.Rice checking wall at front of building
HNu reading 50 ppm on wall.
OVA nothing
Wall is a brick wall with yellow paint that is peeling and cracking away.
Entire wall is like that. Appears very old.

Warehouse is full with material stacked on pallets.
Made in China
PVC film, Gadolinium oxide 50 kgs
Bunk bed boxes, 14 drums on pallets
Approx ? gallon barrels

In center of warehouse there is no reading above background from OVA and HNu

1051 RR. bells begins to ring

Some stains on floor by center of front building
No readings from OVA and HNu on stains
5 ppm from wall on HNu. Nothing OVA

Randy Rice 4/14/88 K.S. Pedersen 4/13/88

Approximately 50 drums (55-gallons) of
Glycerine USP 99.5% Min.
Made in Columbia

These are all Clean drums stacked on pallets.
RR 4/14

1100 BP and RR off air.

1107 Remove air tanks at decon area.

1110 & BP 4/12 RR and BP return to warehouse to take photos. Will stay in areas where we had no air readings above background. RR 4/14

small barrels of Gadolinium oxide 5 barrels
Yttrium oxide 10 barrels

Two photos of barrels. May be underexposed. Very dark.

P8 and P14 are pictures of ceiling with peeling and P14 has roof collapsing.

1130 Leave warehouse.

1140 P-16 taken down along SPCA and C. Mundt building
P-17 taken NW at front of building
P-18 taken East at SPCA building
P-19 NUS truck in front Of C. Mundt building. RR 4/14

Randy Rice 4/14/88 B. Pedersen 4/12/88

1150 P-20,21 front of building showing sign of business occs.

P-22 front gate, which is now closed, but was open during SI.

John, the fork lift operator, told B. Pedersen that while the drums were stored on-site, the fumes were very bad. He occasionally felt dizzy while working near the drums. He said that ~~the~~ RP 4/12 he had a partner that worked with him that sometimes felt ill from the fumes and sometimes he vomited. RP 4/12 He no longer feels that way since the removal of the drums. RR 4/14

1055 Leave site.

SCBA #

428550 B. Pedersen

192036 R. Rice

192035 R. Pagano

Mini Rad-Alert # 428522

Randy Rice 4/14/88 Brian Pedersen 4/13/88

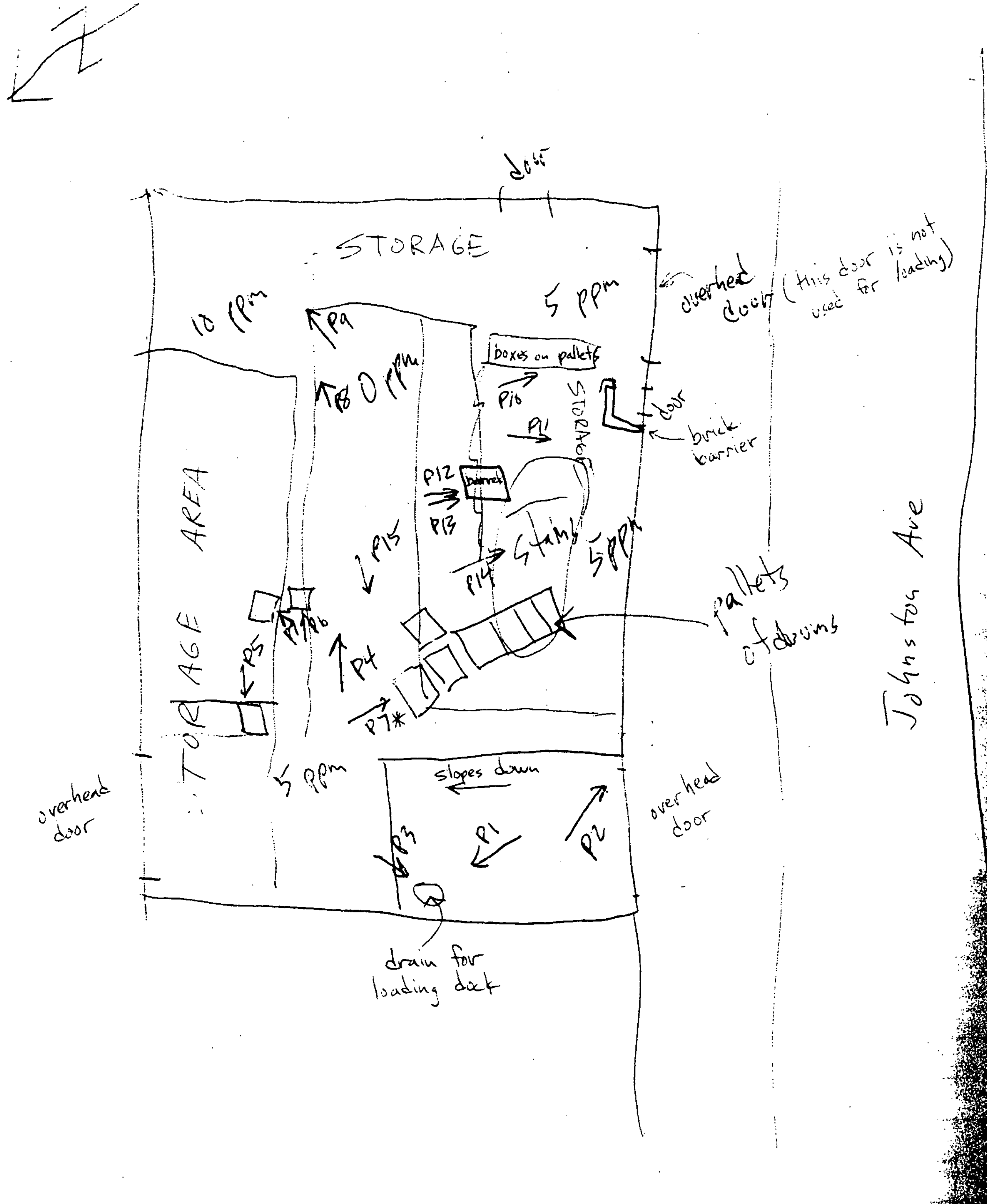
The forklift operator, John, told B. Pedersen that the drain at the bottom of the loading dock is connected to the building next door on Johnston Ave. The drain sometimes backs up with water that is from the building next door and will overflow into the loading dock bay. The water is usually oily. If they complain to the people next door they will usually come over and try to clear the blockage or attempt to drain the water with a hose.

The loading dock bay slopes down from the entrance of the ~~bui~~ building to the bottom of bay in the building. The bottom is about 3 feet down from the level of the warehouse floor.

John said that there are doors to the other sections of the building but they are not used. There are separate businesses located behind C. Mundt on Fairmount Ave. The section of the building that is east ~~of the~~ on Johnston Ave is not used by anyone from where the drums were stored. John did not know what this area was used for at present. He does not have access to that area.

Randy Rice 4/14/88

Brian Pedersen 4/12/88




Randy Rice 4/14/88 B. Poderson 4/12/88

Charles Muget & Sons

02-8803-35
4/12/88

Photo Log

| No. Frame | Time | Description |
| --- | --- | --- |
| 1P-1, 1$-1 | | Looking north at drain in loading dock area. |
| 1P-2, 1$-2 | | Looking south at edge of loading dock and door. |
| 1P-3, 1$-3 | | Looking down from top of loading dock into drain. |
| 1P-4, 1$-4 | | Looking southwest into warehouse open area. |
| 1P-5, 1$-5 | | Photo of pallet of material - Sachtolith L". |
| 1P-6, 1$-6 | | Photo of second type of material stacked on pallets. |
| 1P-7, 1$-7 | | Photo of third type of " " " " |
| 1P-8, 1$-8 | | Photo looking ~~we~~ BP 4/12 east at ceiling showing peeling paint. |
| 1P-9, 1$-9 | | Photo of northeast corner of building, looking east. |
| 1P-10, 1$-10 | | Photo of southeast corner, looking south over boxes. |
| 1P-11, 1$-11 | | Photo of front wall showing peeling paint, look southwest. |
| 1P-12, 1$-12 | | Photo of barrel containing Gadolinium oxide, maybe underexposed. |
| 1P-13, 1$-13 | | Photo of barrel containing Yttrium oxide, " " |
| 1P-14, 1$-14 | | Looking up to ceiling, showing where ceiling collapsed from water. |
| 1P-15, 1$-15 | | Photo of ~~the~~ drums stacked near loading dock, looking northwest. |
| 1P-7*, 1$-7* | | Photo of drums stacked near loading dock, looking south. |

(This photo is out of sequence. It should follow 1P-7, 1$-7, but was numbered incorrectly on map on page 5. All of the following frame numbers should be increased by one, i.e.: 1P-7* should be 1P-8 and 1P-8 should be 1P-9, etc. BP 4/12

| No. Frame | Time | Description |
| --- | --- | --- |
| 1P-16, 1P-16 BP 4/12 | 1145 | Looking ~~north~~ ~~northeast~~ BP 4/12 at ~~front of building~~ area between Charles Muget and SPCA building. BP 4/12 |
| 1P-17, 1$-17 | | Looking northwest at front of building, standing in the middle of the street. |
| 1P-18, 1$-18 | | Picture of SPCA building, looking east. |
| | | Photo of NUS suburban truck |
| 1P-19, 1$-19 | | BP 4/12 ~~One~~ of two photos showing sign on ~~front~~ wall BP 4/12 of building ~~saying~~ BP 4/12 that reads "Charles Muget" |
| 1P-20, 1$-20 | | |
| 1P-22, 1$-21 | | Photo of front gate of building that was used by NUS to enter building, looking north |

Randy Rice 4/14/88 Brian Pedersen 4/12/88

REFERENCE NO. 3

SW02747

# State of New Jersey

## DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WASTE MANAGEMENT

120 Rt. 156, CN 402, Yardville, N.J. 08625

JACK STANTON
DIRECTOR

LINO F. PEREIRA
DEPUTY DIRECTOR

IN THE MATTER OF )
FOURTEEN FLORENCE STREET)
CORPORATION )

ADMINISTRATIVE
CONSENT ORDER

The following ORDER is issued pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection (hereinafter, "the Department") and duly delegated to the Assistant Director for Enforcement and Field Operations, Division of Waste Management, pursuant to the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq. and the rules and regulations promulgated pursuant thereto.

## FINDINGS

1. Fourteen Florence Street Corporation (hereinafter, "the Corporation") is the owner of record of the warehouse located at 498 Johnston Avenue, Lot 44-C, Block 2083, Jersey City, Hudson County, New Jersey (hereinafter, "the warehouse").

2. Investigations by this Department, on December 5, 1980, disclosed that the warehouse was being used as a "disposal" facility as that term is defined in N.J.A.C. 7:26-1.4, in violation of N.J.A.C. 7:26-3.3(b) and (c).

3. On June 15, 1981 the Department issued a NOTICE OF PROSECUTION and ORDER to the Corporation. That NOTICE and ORDER are incorporated herein by reference. The Corporation has denied the allegations under the NOTICE OF PROSECUTION and any responsibilities under the statutory provision set forth in paragraph 2 above.

4. Since the issuance of the NOTICE and ORDER, the Corporation has arranged with generators for the removal of approximately two hundred (200) of the approximately four hundred (400) drums of hazardous waste which had been disposed of in the warehouse.

5. The approximately two hundred (200) drums remaining in the warehouse constitute a continuing violation of N.J.A.C. 7:26-2.2(b) and (c) and the ADMINISTRATIVE ORDER issued on June 15, 1981.

ORDER

NOW, THEREFORE, IT IS HEREBY ORDERED AND AGREED that based upon the mutual agreement set forth herein and as a result of the complete settlement of all matters set forth in the NOTICE OF PROSECUTION, the Corporation consents to this ORDER and AGREEMENT as follows. The Fourteen Florence Street Corporation shall:

1. Within 15 days of signing this ADMINISTRATIVE CONSENT ORDER, submit to the Department a report identifying any drums which are leaking or spilling their contents or which appear to be in such poor condition that leakage or spillage would be likely to occur upon movement of the drum and certifying that such drums have been repackaged.

2. Within 60 days of signing this ADMINISTRATIVE CONSENT ORDER, submit to the Department a schedule for the removal of all waste from the warehouse. Such removal shall be scheduled to be completed within 90 days of signing this ADMINISTRATIVE CONSENT ORDER and shall be carried out in compliance with all Federal and State statutes, rules and regulations governing the disposal of hazardous waste.

3. Notify the Division of Waste Management, Northern Field Office, Acting Region Chief David Longstreet (201-648-2560) at least 48 hours prior to the time scheduled for any shipment of waste from the warehouse so that such shipments may be monitored by the Department.

4. Upon completion of the removal of all waste from the warehouse, submit to a compliance inspection by the Department.

5. Upon approval of the adequacy of the removal operation by the Department, be granted a waiver of the $20,000 penalty settlement offer of June 15, 1981 and be released of all claims for damages and statutory penalties.

RESERVATION OF RIGHTS

This ADMINISTRATIVE CONSENT ORDER shall be fully enforceable in the Superior Court of New Jersey having jurisdiction over the matter and signatory parties upon the filing of a summary action for compliance pursuant to the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq., and also may be enforced in the same fashion as an Administrative Order issued by the Department pursuant to this same statutory authority. This ADMINISTRATIVE CONSENT ORDER shall not prohibit, prevent or otherwise preclude the Department from taking whatever actions it deems appropriate to enforce the solid waste management laws of the State of New Jersey in any manner not inconsistent with the terms of this ADMINISTRATIVE CONSENT ORDER.

Nothing contained in this ADMINISTRATIVE CONSENT ORDER shall prohibit, prevent, or otherwise preclude the Corporation from taking action against a third party for the costs, expenses and obligations imposed under the terms of this ADMINISTRATIVE CONSENT ORDER.

No obligations imposed by this Order are intended to constitute a debt, damage claim, penalty or other civil action which should be limited or discharged in a bankruptcy proceeding. All obligations imposed by this Order shall constitute continuing regulatory obligations imposed pursuant to the police powers of the State of New Jersey, intended to protect the public health, safety and welfare.

The Fourteen Florence Street Corporation hereby consents to the entry of this ADMINISTRATIVE CONSENT ORDER and waives any right it might have to a hearing concerning the matters set forth herein, pursuant to N.J.S.A. 52:14B-1 <u>et seq.</u>

DATE March 7, 1983

Joseph A. Rogalski
Assistant Director of Enforcement and Field Operations
DIVISION OF WASTE MANAGEMENT

FOURTEEN FLORENCE STREET CORPORATION

DATE April 1, 1983

By: Gennaro Mecca, President

REFERENCE NO. 4

# MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO File

FROM D. Dawson

DATE June 12, 1985

SUBJECT Johnston Avenue Warehouse

On 6/7/85 at 1310 hrs I inspected the Johnston Avenue Warehouse for compliance with the 4/1/83 Administrative Consent Order. Eddie, an employee of R&R Trucking who is a tenant in the warehouse, accompanied me to the area that had been used to store hazardous wastes.

The area presently contains pallets of cardboard sheets, cartons of tickets, and containers of chocolate flavoring and other foodstuffs. The drums & tank have been removed; the spills, speedy-dri, and empty drums are gone. Eddie said that it was cleaned up a while ago, and now Mr. Mecca stores chocolate and other foods here. The floor still contains puddles of rainwater, as the roof has not been repaired yet.

FON5/kb

REFERENCE NO. 5

ROSNER AND FELTMAN
COUNSELLORS AT LAW

235 MOORE STREET
HACKENSACK, N. J. 07601

201 487 4500

MYRON ROSNER
MICHAEL P. FELTMAN
NATALIE E. FEEHAN
ANDRE SHRAMENKO
KEITH E. PATERSON

February 17, 1982

Ms. Barbara M. Greer
Office of Enforcement
State of New Jersey
Department of Environmental Protection
P.O. Box 1390
Trenton, New Jersey 08625

Re: 498 Johnson Avenue
Jersey City, New Jersey
Dri-Print Foils
Our File No. 81-375-1

Dear Ms. Greer:

I enclose copy of February 11, 1982 memo concerning certain components found in the samples in the drums at the warehouse in Jersey City.

If you would manifest same and touch base with us as to the cost of removal, we can draw this matter to a conclusion.

Very truly yours,

Michael P. Feltman

MPF/ljc
Enclosure

February 11, 1982

TO: PAUL MORELLO

FROM: CLEM CASO

This is an approximate analysis of the ink samples that represent the drums in question, based on raw materials used in our plant.

SAMPLE #1 -- INK - GRAY

Black Pigment
White Pigment
Vinyl
Acrylic
Keytone Solvents
Aromatic Solvents

SAMPLES #2,3,4,6 - COLOR INKS

Dyes
Nitrocellulose Lacquer
Acrylic
Keytone Solvents

SAMPLES #7,8 - METALLIC INKS

Aluminum Powder
Acrylic
Vinyl
Keytone Solvents
Aromatic Solvents

SAMPLE #5 - U.V. INK

Oligomer
Acrylates
Methylacrylic Acid

REFERENCE NO. 6

JERSEY CITY
SITE
Marion
HOLY NAME CEMETERY
LINCOLN PARK
St Peters College
St Aloysius Sch
St Aloysius Academy
Journal Square
County Courthouse
Dickinson HS
Rogosin HS
Christ Hospital
Hamilton Park
Medical Center
Montgomery Park
Fairmount Hospital
Police
Lincoln High Sch
Lafayette Park
Arlington Park
St Patricks Sch
Communipaw
Snyder HS
Jersey City State College
Desmond Park
Sacred Heart Sch
Skinner Park
City Hall
Morris Canal Basin
LIBERTY STATE PARK
Sewage Disposal
Tollgate
INTERCHANGE
Claremont Yards
Service Facilities
Black Tom
New York Bay Cem
Bayview Cemetery
U S MILITARY RESERVATION
CAVEN POINT ARMY TERMINAL
Claremont Terminal
Caven Point
GREENVILLE YARDS
Tidal Flat
Light
Ellis Island
STATUE OF LIBERTY NAT MON
Liberty Island
STATUE OF LIBERTY NAT MON
HUDSON CO
NEW Y
KINGS
TURNPIKE
CONRAIL
COMMUNIPAW
MONTGOMERY
GRAND
NEW JERSEY
NATIONAL DOCKS
SKYWAY
TRANS HUDSON

REFERENCE NO. 7

# Endangered & Threatened Wildlife and Plants



**APRIL 10, 1987**
**50 CFR 17.11 & 17.12**

REFERENCE NO. 8

Official State Estimates

# Population Estimates for New Jersey

## JULY 1, 1982

OFFICE OF DEMOGRAPHIC AND ECONOMIC ANALYSIS
DIVISION OF PLANNING AND RESEARCH
DEPARTMENT OF LABOR
TRENTON, NEW JERSEY

# POPULATION ESTIMATES FOR NEW JERSEY:

## REVISED ESTIMATES, JULY 1, 1981

## AND

## PROVISIONAL ESTIMATES, JULY 1, 1982

---

OFFICIAL STATE ESTIMATES

---

STATE OF NEW JERSEY

THOMAS H. KEAN, GOVERNOR

Department of Labor

Roger A. Bodman, Commissioner

Office of Demographic and Economic Analysis

Division of Planning and Research

CN 388

Trenton, New Jersey 08625-0388

September 1983

RESIDENT POPULATION

| HUDSON COUNTY | CENSUS COUNTS, APRIL 1, 1980 | REVISED ESTIMATES, JULY 1, 1981 | PROVISIONAL ESTIMATES, JULY 1, 1982 |
|---|---|---|---|
| Bayonne city | 65,047 | 64,891 | 64,283 |
| East Newark borough | 1,923 | 1,915 | 1,896 |
| Guttenberg town | 7,340 | 7,413 | 7,339 |
| Harrison town | 12,242 | 12,292 | 12,254 |
| Hoboken city | 42,460 | 42,395 | 42,104 |
| Jersey City city | 223,532 | 222,405 | 221,937 |
| Kearny town | 35,735 | 35,612 | 35,255 |
| North Bergen township | 47,019 | 47,485 | 47,073 |
| Secaucus town | 13,719 | 14,634 | 15,017 |
| Union City city | 55,593 | 57,436 | 56,709 |
| Weehawken township | 13,168 | 13,471 | 13,335 |
| West New York town | 39,194 | 42,214 | 41,798 |
| TOTAL | 556,972 | 562,163 | 559,000 |

REFERENCE NO. 9

A GERAGHTY & MILLER SPECIAL REPORT

# The New Jersey Ground-Water Situation

by David W. Miller

August, 1979 (see telecon note - 02-8803-32-SI ~~02-8805-01~~ 5/12/88


GERAGHTY & MILLER, INC.
Groundwater
Consultants

HACKENSACK, NEW JERSEY
7 Atlantic Street
Hackensack, New Jersey 07601
(201) 646-1400

SYOSSET, NEW YORK
North Shore Atrium
6800 Jericho Turnpike
Syosset, New York 11791
(516) 921-6060

# THE NEW JERSEY GROUND-WATER SITUATION

## INTRODUCTION

This special report is based on work carried out by Geraghty & Miller, Inc. during its involvement in preparation of the State Water Supply Master Plan under contract to the NJDEP (New Jersey Department of Environmental Protection). It presents an overview of the state's ground-water resource, which satisfies some 40 percent of the recorded public water use in the nation's most densely populated and heavily industrialized state.

The original report has been edited in an effort to present a simple guide to the New Jersey ground-water situation. The information provided is based on a detailed review of published and unpublished geologic and hydrologic data on file with the State Geologist's Office, the NJDEP, and the USGS (U.S. Geological Survey). Representatives of local and county public agencies were interviewed along with water supply officials and others involved in the development and/or management of ground-water resources. Finally, much of the report is based on Geraghty & Miller, Inc.'s and the author's own work and experience over the past 30 years consulting for municipalities and industries throughout New Jersey.

## SUMMARY

Total ground-water pumpage in New Jersey is on the order of 750 mgd (million gallons per day), with almost 450 mgd withdrawn from the unconsolidated Coastal Plain aquifers of southern New Jersey, and 300 mgd from the sand and gravel and rock aquifers of northern New Jersey.

Because the Coastal Plain aquifers have a great areal extent, high recharge rate, and tremendous storage capacity. the ground-water potential for this region is at least several times the present rate of pumpage. Constraints on the future use of this resource will be caused by the impact of pumpage on streamflow, the severity of contamination from man's activities, and the economic and institutional feasibility of transporting ground water from undeveloped aquifer areas to water-short localities.

In some areas of heavy pumpage, such as eastern Monmouth and Ocean Counties, the development of surface-water sources to supplement ground-water supplies will be necessary. Other overstressed areas, such as western Camden and northeastern Middlesex Counties, can be served by regional well fields located outside of the heavy demand centers.

In several northern New Jersey counties, such as Bergen, Essex, southern Passaic, Union and eastern Morris, heavy pumpage from the Brunswick shale and the stratified drift deposits, together with consumptive water use, has overstressed aquifers locally. Some potential for developing new supplies does exist at points distant from present demand.

In western Morris, northern Passaic, northern Hunterdon, Sussex, and Warren Counties, ground-water development has not been extensive because of the area's rural nature. However, except for some limestones, the area's rock aquifers are relatively poor. Stratified drift deposits offer a greater potential, but they have not been sufficiently explored. Their full development would tend to diminish streamflow.

Urbanization and industrial activities have degraded ground-water quality, and will continue to limit the development of ground-water resources. The discovery of heavy metals and organic chemicals in ground-water supplies has forced the restriction and closing of public supply and domestic wells. Much of this contamination is related to land disposal of industrial and municipal waste and leaks and spills of petroleum and chemical products.

In spite of numerous local and some regional problems related to over-pumping and contamination, New Jersey's dependency on ground water for public supply, industry, and agriculture will increase in the future. This will be due, in large measure, to the economic, environmental, and institutional problems related to securing, transporting, treating and storing large volumes of surface water.

## THE AQUIFER SYSTEMS

For a general discussion of ground-water conditions in New Jersey. the state can be divided into three broad geographic areas based on the distinctive rock types that occur in each (Figure 1). The Coastal Plain physiographic province is the largest area, and encompasses more than 5,000 square miles in the southern portion of the state. The geology of the Coastal Plain is characterized by a southeasterly dipping and thickening sequence of unconsolidated sediments.

The Triassic Lowlands are underlain by thousands of feet of red shale, with some sandstone, siltstone, conglomerate, basalt and diabase. The geologic formations in the Highlands region consist of hard crystalline rocks such as the Precambrian gneisses and quartzites; carbonates, such as the Kittatinny limestone; and relatively dense sandstones, conglomerates and shales, such as the Martinsburg.

Bedrock in both the Triassic Lowlands and the Highlands is overlain by unconsolidated deposits of glacial origin. In places, these surficial deposits are thick and permeable, and are commonly in direct hydraulic connection with the underlying bedrock and adjacent streams, rivers, and lakes.

# THE TRIASSIC LOWLANDS AND THE HIGHLANDS REGION OF NORTHERN NEW JERSEY

The geology and hydrology of northern New Jersey are considerably more complex than the Coastal Plain region. To simplify, it has been divided into two broad areas, the Triassic Lowlands and the Highlands Region (Figure 1). Unlike the Coastal Plain, where the aquifers consist of extensive beds of unconsolidated deposits, the primary water-bearing units in northern New Jersey are sedimentary and crystalline rocks (Figure 11). These vary considerably in their ability to yield water, depending on rock type and location. Both regions are also heavily dependent upon unconsolidated glacial deposits for water supply and where these occur in buried, eroded rock channels and are thick and permeable, the glacial sediments represent the most important source of ground water in both the Triassic Lowlands and the Highlands. Figure 12 shows the general major deposits of glacial origin that may have some ground-water potential.

## Geology and Hydrology

Triassic Sediments: The Triassic Lowlands are almost entirely underlain by sedimentary Brunswick Shale. Although its primary permeability is low, appreciable amounts of water are found in joints and fractures. However, unless a significant number of these joints and fractures are penetrated by a well, yields can be relatively small. The direction of highest permeability and of the greatest movement of water in response to pumping tends to parallel the strike of the beds, generally southwest to northeast.

In general, the principal water-bearing zone of the Triassic rocks ranges from less than 200 feet to 600 feet in depth. The median depth of industrial and municipal supply wells in Bergen County is 260 feet. High-yield wells tapping this aquifer in Essex County are between 300 and 400 feet deep. There appears to be a direct relationship between well yield and thickness of overlying unconsolidated glacial deposits. Wells generally produce more where the overlying deposits are relatively thick, stratified, and coarse-grained. These surface deposits are often in direct hydraulic connection with the bedrock, and act as a source of recharge because of their greater capacity to receive and store precipitation (Figure 12).

A number of high capacity wells tap the Triassic rocks. In Essex County, yields of 35 public supply, industrial, and commercial wells range from 35 to 820 gpm (gallons per minute) and average 364 gpm. Wells over 300 feet deep and larger than 8 inches in diameter have a median yield of 230 gpm in Passaic County. However, the ability to develop high capacity wells is not uniform throughout the region. Many wells drilled during exploration programs are never equipped as production wells because of poor yields.

Igneous rocks associated with the sedimentary formations, principally diabase and basalts, are highly resistant to erosion and form the ridges of the Watchung Mountains and the Palisades. They are poor aquifers, tapped primarily for domestic purposes by wells yielding 5 gpm or less.

Precambrian Rocks and Paleozoic Sediments: The Highlands Region is underlain by dense bedrock of limited ground-water potential. Rocks in the area immediately adjacent to the Triassic Lowlands, and situated in a northeast-southwest band through the central portion of northern New Jersey, consist chiefly of Precambrian gneisses (Figure 11). These crystalline rock formations contain ground water in joints and fractures of limited extent and storage capability. Well yields are relatively small, seldom over 150 gpm. In Sussex County, 45 percent of the domestic wells tapping the Precambrian gneiss yield 5 gpm or less.

Several very dense limestone formations containing solution cavities are associated with the Precambrian gneisses. In rare instances where these cavities have been penetrated by wells, yields can exceed several hundred gpm. In most cases, ground water is contained in joints and fractures which typically yield 15 gpm or less to wells.

The northwestern portion of the state is characterized by a parallel series of valleys and ridges composed of Paleozoic age sedimentary rocks (Figure 11). The ridges are resistant limestones, sandstones, and conglomerates. The valleys are underlain by softer shales, siltstones, calcareous shales, and limestones. Although these rocks are not good aquifers, they are an important source of water for domestic wells. The only exception is the Kittatinny Limestone, which underlies portions of Sussex, Warren, and Hunterdon Counties. In Hunterdon County, industrial wells tapping this formation and penetrating solution cavities typically yield 400 gpm; a few produce as much as 1,500 gpm.

Glacial Sediments: Unconsolidated deposits overlying rock in northern New Jersey consist generally of till, clay, or stratified drift. These deposits are thickest in the valleys and thin or absent in upland areas. Permeable sands and gravels contained within the valley fill sediments that are suitable for ground-water development range in thickness from 50 to several hundred feet. Individual beds that can support high capacity wells are not extensive, and lithology may change radically over as little as 100 feet within the same valley. Well yields commonly reported for the glacial sediments represent successful wells located from a program of test drilling and pumping.

Although the rock aquifers have been mapped in some detail throughout both the Triassic Lowlands and the Highlands Region, the areal extent of important glacial aquifers is relatively unknown except in some of the more heavily developed areas of eastern Morris and western Essex Counties, Union County, the Ramapo River subbasin, and the Rockaway River subbasin (Figure 12).

Public supply and industrial wells tapping the more permeable stratified drift are almost uniformly capable of producing several hundred thousand gpd to more than one mgd. For example, yields of wells completed in Union County in 50 to 200 feet of sand and gravel sediments in Kenilworth-Newark Valley, Summit Valley, Union Valley, and Rahway Valley, average approximately 400 gpm. Wells in Essex and Morris Counties tapping glacial sands and gravels adjacent to the Passaic River and its tributaries produce one to 1.5 mgd. Total pumpage from the system of buried valleys in this latter area is about 20 mgd, with the highest yields from formations receiving recharge from adjacent streams.

## Relationship Between Ground and Surface Water

Little effort has been devoted to establishing the relationship between ground-water withdrawals and streamflow in northern New Jersey. Many planners and regulatory personnel consider surface water and ground water as different resources. In fact, diversions have been awarded individually for either surface-water rights or ground-water rights in the same basin. The impacts of the aggregate diversion of the two interrelated resources are rarely investigated in detail.

Studies of the Ramapo River subbasin indicate that the Ramapo River is a losing stream during part of the year over a portion of its reach; at times it is a losing stream for its entire length from the state line to Pompton Lake. Generally, this seepage loss extends further downstream as the summer season continues. Much of the loss is attributable to ground-water pumpage along the Ramapo channel, substantiating the ability of ground-water pumpage within the basin to reduce river flow and at times actually cause river water to recharge the aquifer.

The Rockaway River subbasin, like the Ramapo, is an area where ground-water pumpage from the stratified drift along the river has an effect on streamflow during dry periods. Jersey City diverts water for public supply from the Boonton Reservoir on the Rockaway River downstream of these ground-water diversions, and a planned expansion of the area's sewage treatment plant will increase the consumptive use of ground water by 2020. Domestic sewage previously discharged back into the ground-water system via cesspools and septic tanks will be discharged downstream of the reservoir, and will reduce ground-water recharge and streamflow.

There are several other locations where ground-water pumpage may be contributing to low streamflow. In the Whippany, Upper Passaic, and Lower Passaic River subbasins, the volume of reported public supply and industrial ground-water pumpage, together with grandfather rights pumpage, significantly affect the streams during low flow periods. The problem also is aggravated by the diversion of potential recharge out of the area through sewer systems. Surface-water resources in these basins are extensively developed for supply and receive and dilute waste water.

Other factors also distort the natural water balance between streams and aquifers. Intensive urbanization, e.g., widespread paving of aquifer recharge areas and construction of storm drains, reduces ground-water recharge and makes less water available to streams between periods of rainfall. The interrelationship of all factors must be considered in order to manage ground-water withdrawals where they are likely to impact surface-water resources.

## Ground-Water Availability

The recharge of ground-water systems by precipitation in northern New Jersey is highly variable, and depends on factors such as the nature of surficial deposits, topography, rock lithology, and structural features. The storage capacity of rocks of the Triassic Lowlands, as well as most of the Precambrian and Paleozoic age rocks of the Highlands Region is low and unevenly distributed; these rocks can be dewatered much more easily than the Coastal Plain sands. This is especially true if the water level in the rocks drops below the fractures which serve as major water producing zones.

Under pumping conditions some of the rock aquifers in northern New Jersey exhibit directional hydraulic behavior. At a given distance from a pumping well, water-level drawdowns are usually greater parallel to the strike, or bedding, of the rocks, than perpendicular to it. These factors make the prediction of maximum yields in the northern part of the state more difficult; detailed site-specific data are necessary in most areas.

Natural recharge rates to valley fill sediments may be as high as one mgd per square mile and additional recharge may be induced from an adjacent stream. Since many streams in northern New Jersey are utilized for community supply, and much of their flow is already committed to present or future river intake systems and impoundments, management decisions regarding greatly increased pumpage from alluvial deposits must be made with great care on an individual case-by-case basis.

Although the glacial deposits represent a major aquifer system and can generally yield larger quantities of water than rock aquifers, they are relatively thin and limited in extent. Thus, where recharge from surface-water bodies is not sufficient to meet the demands of local heavy pumpage, dewatering of these aquifers can take place, resulting in lowered water levels and declining yields.

Ground-water availability and problems resulting from excessive withdrawals are usually discussed in terms of an aquifer's "safe yield". Studies done for various counties have attempted to estimate this value for each county. However, from a planning viewpoint, safe yield should be considered as the greatest amount of ground water that can be used consumptively over a long term without causing undesirable effects. Depending on the area, these effects may include reducing streamflow, lowering lake levels, and dewatering shallow wells as a result of a falling water table.

Most reports equate safe yield with the pumpage which will approach, but not exceed, the average recharge rate for the study area. While maintaining the amount of pumpage below the average recharge rate will not cause ground-water mining (loss of ground water from storage for an indefinite period), it can result in a temporary loss of storage and in water-level declines until a new equilibrium elevation is reached. Actually, maximum potential yield depends on a wide range of prevailing hydrologic and environmental relationships in a particular area.

Another complicating factor in the intelligent management of the resource is consumptive use of ground water, i.e., where water is not returned to the ground-water system from which it was removed. On-lot septic systems and wells which recharge industrial process or cooling waters return water to the ground and do not represent consumptive uses. Wastewater discharges to sewers, which in turn discharge to surface waters, are assumed to be consumptive, and are an important factor in reducing ground-water availability, especially in northeastern New Jersey (Figure 13).

Finally. land-use planning in the heavily urbanized northeast portion of the Triassic Lowlands has generally failed to consider the adverse effects of paving potential recharge areas. and/or the impact of construction of regional sewers on ground-water availability. In addition, many communities wholly dependent on ground water are so built up that there is not enough remaining open space to carry out the exploration necessary to locate additional production well sites.

In the preparation of this special report, factors affecting ground-water availability such as recharge rates, pumpage, diversion rights, consumptive use, and interference with surface-water supplies were evaluated on a county-by-county basis. This information was supported by interviews with ground-water users and public agency personnel, and review of data from organizations involved in water-resource management (state, USGS, interstate agencies, and private consultants). Table 2 summarizes ground-water pumpage in northern New Jersey.

Bergen County: Generally, the eastern section of the county is supplied by surface water and the western section by ground water. Portions of the central and southwestern sections are served by both.

Because yields are generally higher, about 75 percent of the pumpage in the Ramapo River basin is from stratified drift, even though it underlies only a small percentage of the total basin area. Wells in valley-fill deposits supply most of Mahwah and all of Oakland.

Industrial and public supply pumpage is concentrated in a central north-south band, east of the Passaic River, and near the Saddle River. Most of the southern and central part of the county is sewered: only public supply pumpage in the extreme northern section of the county is not used consumptively. The percentage of industrial pumpage used consumptively is unknown, but many of the industrial plants along the Passaic and Saddle Rivers discharge to the rivers, and the water is essentially lost from the ground-water system. There are indications of areawide water-level declines in southern Bergen County from overpumping the Triassic shales.

The opportunity for further development of ground water depends to a great degree on the future industrial pumpage, and the ability to develop surface water and ground water conjunctively in basins containing significant glacial deposits. The bedrock aquifer already appears to be overstressed in areas of concentrated pumpage.

Essex County: Ground water accounts for about 28 percent of the total water used in the county. More than 80 percent of the 35 mgd pumped for public supply is obtained from stratified drift deposits, mostly in the western portion of the county. This heavy pumpage and urbanization in the Livingston-Florham Park-Millburn area have resulted in severe water-level declines in both the unconsolidated and sandstone aquifers, which function as a single hydraulic unit in the area (Figure 12).

Heavy pumpage from the Triassic sediments in the Newark area has exceeded the average recharge to the system, and water levels have been declining for years with serious salt-water intrusion from Newark Bay and the Passaic River. Newark and the western valley-fill aquifer areas are of

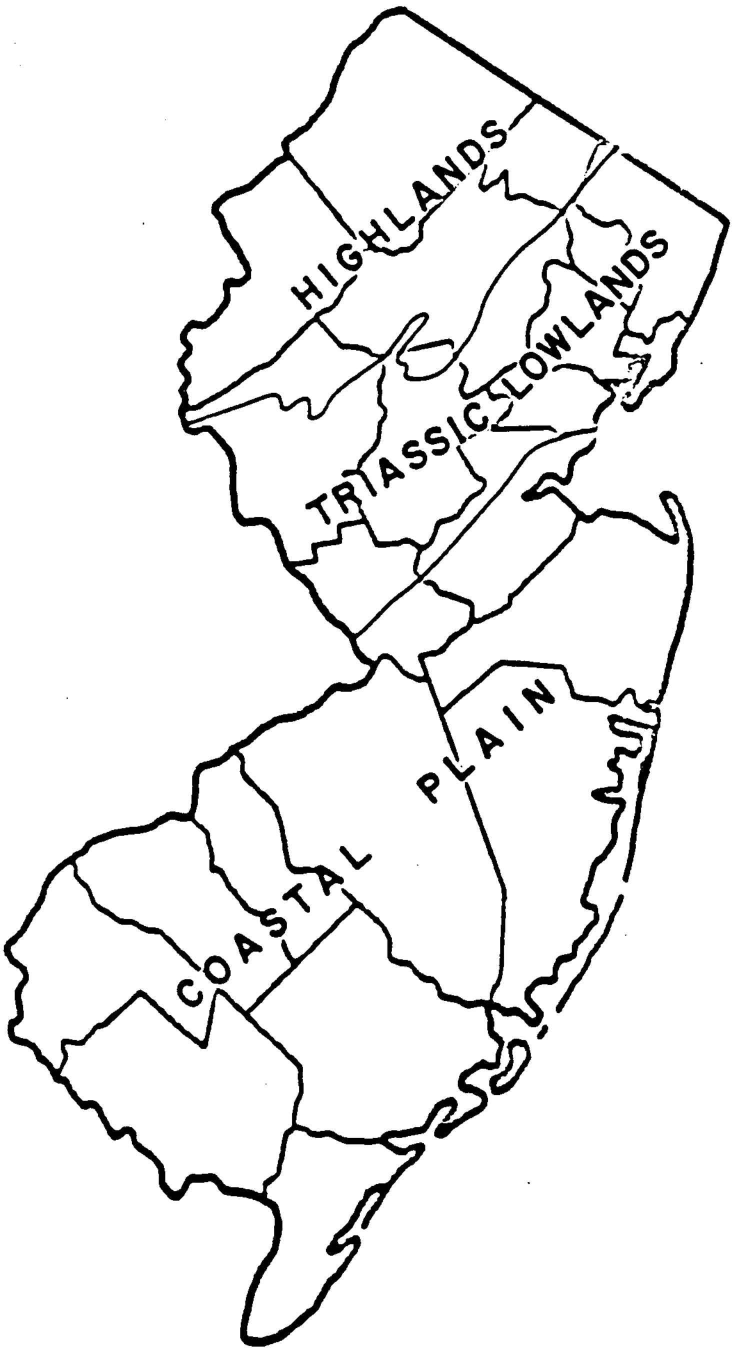



Figure 1 - PRINCIPAL GEOLOGIC REGIONS

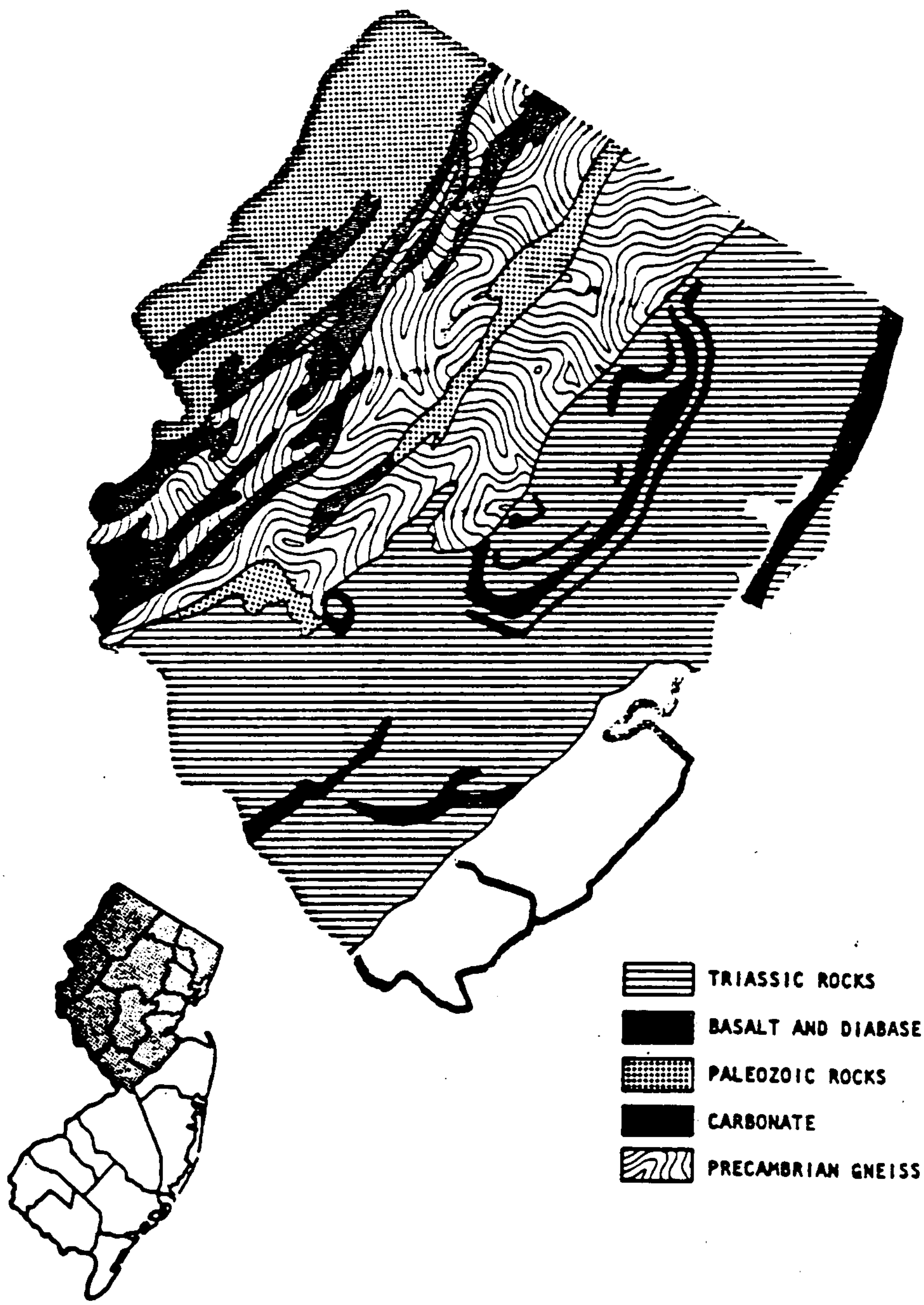



Figure 11 - BEDROCK GEOLOGY IN NORTHERN NEW JERSEY

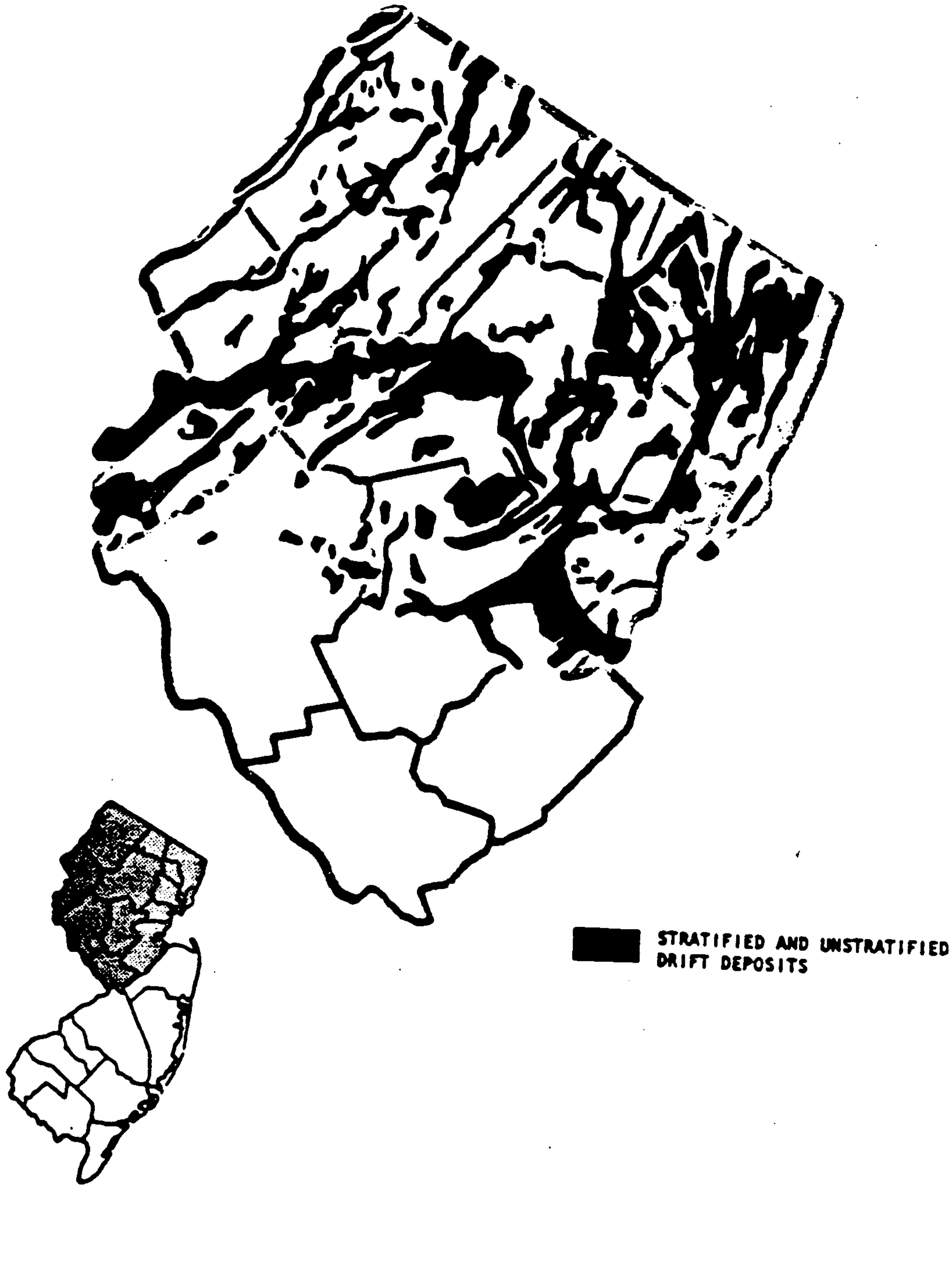



Figure 12 - POTENTIAL UNCONSOLIDATED AQUIFERS IN
NORTHERN NEW JERSEY

REFERENCE NO. 10

JERSEY City, Hudson Co, NJ

Werbin

EXXON Co, USA - Eagle WORKS
02 - 8403 - 46A

# GEOLOGY AND MINERAL RESOURCES

# OF THE

# MIDDLE AND LOWER HUDSON RIVER VALLEY

By


John G. Broughton
James F. Davis
John H. Johnsen


1966

Hudson River Valley Commission


New York State Museum & Science Service

Geological Survey

Just south of Peekskill is an unusual group of rocks known as the Cortlandt Complex. These are igneous and have intruded the older Manhattan schist. The ensuing natural chemical reaction has resulted in the development of emery deposits, a mixture of hard minerals having valuable abrasive properties.

The bedrock geology north of the Highlands is more simple. From Cornwall north to Kingston, the northeast-southwest trend of the rocks is continued but there is little variety. The major rock type is shale (On and Osh) of Ordovician age. Hills of these rocks are the result of local beds of tough gray sandstone interlayered with the shales. Less extensive are the Cambrian and Ordovician dolostones (€Os) which underlie the shales and are exposed in a belt from Newburgh northeast to beyond Poughkeepsie and as small areas just south of the Highlands at Tompkins Cove and Verplanck.

North of Kingston the shales continue to floor the river lowland, but on the west side of the river cliffs appear which are formed of still younger rocks lying above the folded shales. These are Silurian and Devonian limestones, usually referred to collectively as the Helderberg Group (Ds and Dhg), after the "mountains" they form and the Onondaga Formation (Don), also a limestone. Still higher and forming foothills of the Catskills are ridges of shales and siltstones (Dhm) which overlie the limestones. East of the river two erosional remnants of the westward eroding Helderbergs, "islands" if you will, expose more of the Helderberg and Onondaga limestones. These Silurian and Devonian limestones are extensively quarried for aggregate and as the raw material for natural and Portland cement.

Distinctive and much younger rocks form the foundations of Rockland County, south of the Highlands. Although the rock cliff of the Palisades seems to drop directly into the river, it is, in fact, resting on a thick series of red shales and sandstones of Triassic age which underlie both the river bed and the trap rock which makes the cliff. The bright red sedimentary rocks are weak and flat-lying so the topography is generally gentle, except for the relief afforded by the Palisades. This distinctive natural feature is the outcrop edge of a sheet of igneous rock intruded as a molten mass between the sedimentary rock layers. The rock is diabase, a dark tough finely crystalline rock that is commonly called trap. Ranging from 400 to 700 ore more feet in thickness, its uniform character and resistance to erosion has resulted in the cliff face which characterizes the west shore of the Hudson from Haverstraw to Jersey City and thence southward and as a ridge across Staten Island. High Tor, Hook and Tallman Mountains are especially high prominences of this cliff. At the north end, the ridge of trap swings westward away from the river, the hook marking the outcrop of a structural sag in the rock. One especially distinctive feature of the trap is its columnar appearance, resulting from intersecting cooling cracks. It is these which have given the stockade-like character to the cliff, resulting in the name - "Palisades".

The youngest rocks in the Valley are not what one would ordinarily consider bedrock. These are the Cretaceous sands and clays (Kr and Km) of Staten and Long Islands which are typical of Coastal Plain sediments along the Atlantic Coast. Previously a source of sand, gravel and high quality china clays, these formations have now been built over and are not of any further economic value. Topographically, they are weak and serve only as a low flat foundation for the later glacial deposits.

The entire Hudson River Valley has been glaciated, that is, it has been covered one or more times with thick glacial ice as far south as the Narrows, and now exhibits the erosive and depositional effects of that frigid advance and retreat. During the advance of the continental glacier, generally from north to south, the thick layer of weathered rock and soil was scraped off the bedrock and incorporated into the ice, further increasing its erosive power. Soft rock was planed down and hard rock abraded and polished. When the ice flow followed a major pre-existing valley, like the Hudson, that valley was deepened and the valley walls ground off to a U-shaped cross section. This is especially noticeable at the northern gateway of the Highlands, between Storm King and Breakneck Ridge. Hard tough basal till, the stony clay mixture commonly known as hardpan is the deposit of the advancing glacier as the soil overload was plastered out under the weight of the thousands of feet of overlying ice.

The terminal moraine which made the ridge cut by the river at the Narrows marks the most southern advance of the ice. Here it stood, in a state of dynamic stability as advance from the north was balanced by accelerated melting. Sand and gravel, silt and clay were spread out by the water pouring from the ice front and forms the plain lying south of the moraine on the shorelines of the Lower Bay.

Later as the ice front melted back and the main sheet broke up, local glacial lakes developed in the lowland areas south of the glacier and clay was deposited in these large fresh water lakes. Those in the general Hudson Valley area were Lake Hackensack - west of the Palisades, Lake Hudson - in the river valley proper and Lake Flushing - in the western reaches of what is now Long Island Sound. These all coalesced in the Upper Bay area. Only in post-glacial times did sea level rise sufficiently to allow marine waters into some of those areas. Clay deposits are characteristic of these lakes. In the Hudson Valley the clay deposits are now below sea level south of Haverstraw.

As the ice broke up and the front melted back, the land rose, relieved of the oppressive weight of ice, on an average of 2 1/4 feet

Small tonnages of crushed rock are marketed by producers of granite building stone in Westchester County. The generally higher crushing costs and dust control procedures required for granite production make competition with other aggregate rock types difficult. Crushed granite production is principally a by-product of granite building stone production in the Hudson Valley where other aggregate materials are accessible.

c. Diabase

The Palisades of the Hudson, a prominent ridge that forms the west shore of the Hudson River from Staten Island, New York, northward through New Jersey to Haverstraw, New York, is a tabular or sheetlike body of diabase (d) intruded into red shales and sandstones of Triassic age and is itself of Late Triassic age. Diabase is the youngest consolidated rock along the river corridor and its occurrence in New York State is restricted to Rockland County.

The ridge is asymmetrical in cross section, with a precipitous scarp facing the river and a gentle backslope dipping towards the west. Portions of the backslope in New York, however, are considerably steeper than in New Jersey. In plan, the ridge is gently convex to the east throughout its length, but at Haverstraw it swings sharply to the west to give it a sickle or hook shape between Nyack and its surface terminus at Mount Ivy. Its serrated crest rises to a maximum elevation of approximately 830 feet above sea level at High Tor immediately south of Haverstraw.

Throughout its length, the Palisades ridge has been cut by a series of nearly vertical faults along which movement has been up or down, offsetting large blocks of the diabase. The base of the intrusive is, therefore, below sea level in some areas and nearly 500 feet above the river in others. Field studies, supplemented by test borings, suggest that the Palisades intrusion is approximately 700 feet thick but nowhere along the scarp is the total thickness exposed; undoubtedly the upper portion has been removed by erosion.

To properly classify diabase, a brief discussion of basalt is warranted. Basalt is a dark igneous rock in which the mineral constituents are too fine to be visible, but under the microscope they are seen to be mostly plagioclase feldspar and pyroxene. This fineness of grain is brought about by rapid cooling such as occurs in thin lava flows. Sometimes basaltic material crystallized in thick bodies, viz., Palisades intrusion, and cooled slowly so that the minerals had time to grow large enough to be visible and to arrange themselves in a particular pattern. Diabase is such a rock. It has distinctive texture characterized by a felt-like network of plagioclase feldspar laths with the spaces between them occupied by later-crystallizing and irregularly shaped pyroxene crystals. This fabric produces a very tough stone.

ne)
rble

ale
for

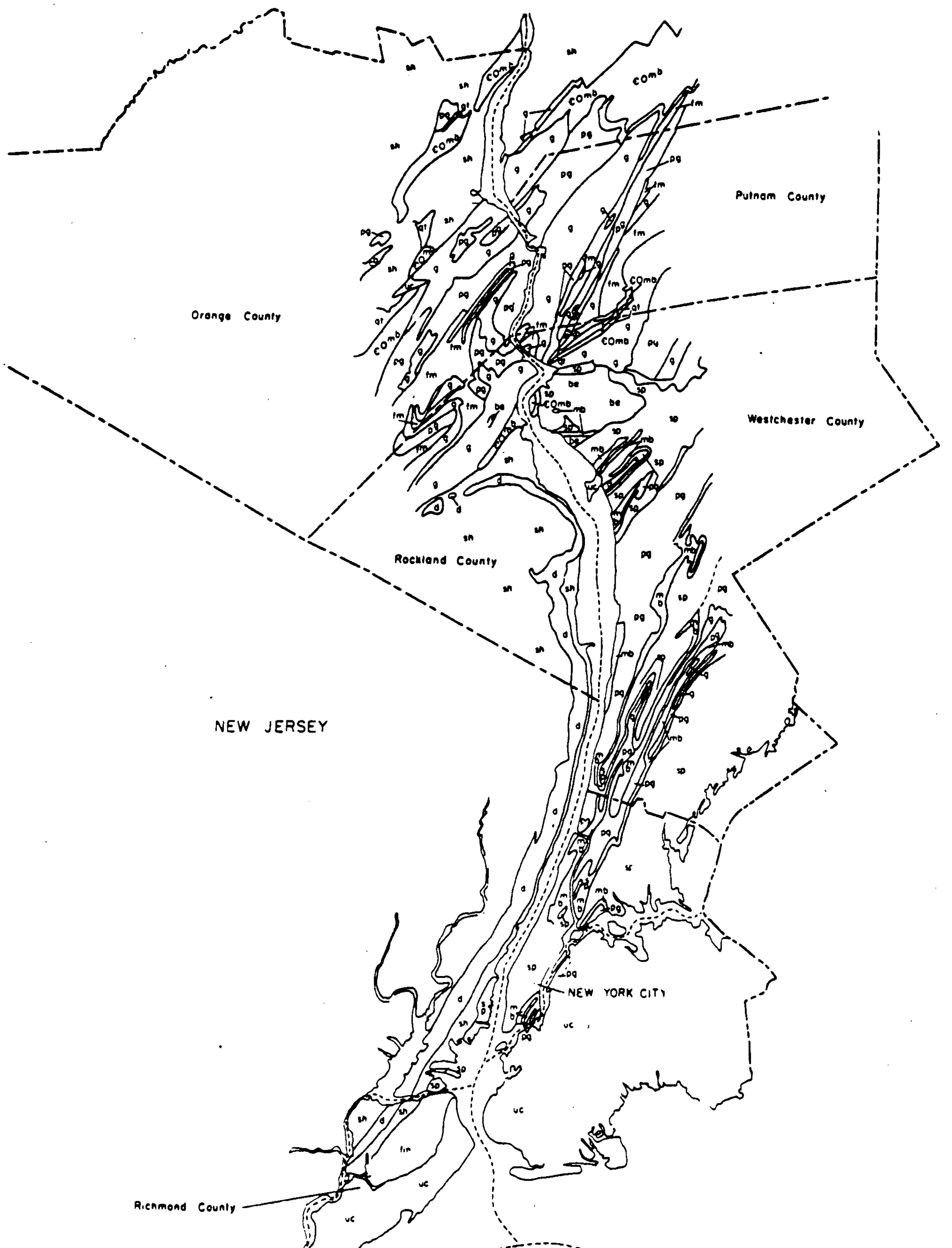
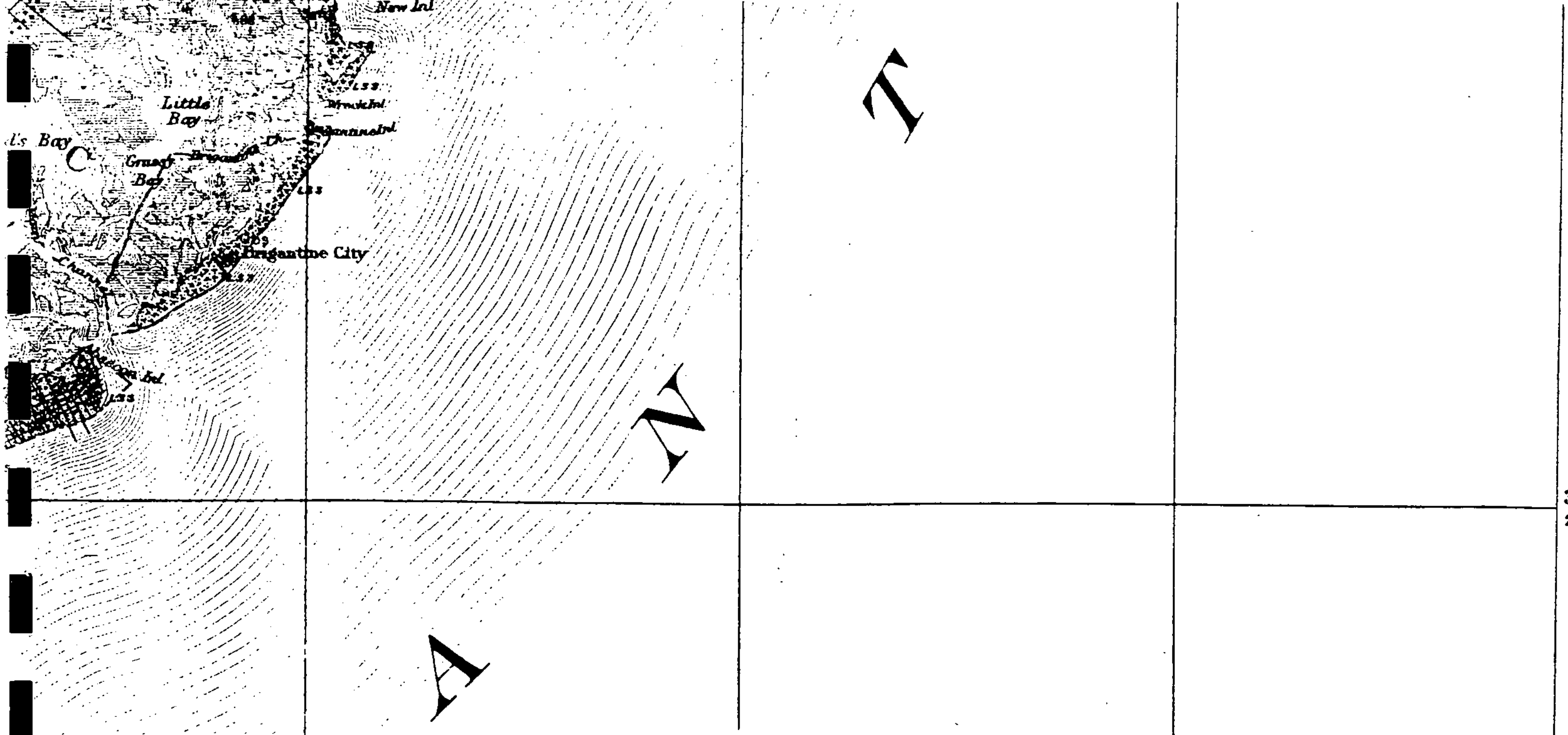



**PLATE II-A**

MINERAL RESOURCE MAP—HUDSON VALLEY

REFERENCE NO. 11




# GEOLOGIC MAP

OF

# NEW JERSEY

Compiled from published folios and from manuscript data in possession of the Survey, the latter chiefly the field work of

W. S. BAYLEY, (Pre-Cambrian)
H. B. KÜMMEL, (Paleozoic, Triassic, Quaternary)
R. D. SALISBURY, (Quaternary)
G. N. KNAPP, (Cretaceous, Tertiary, Quaternary)

BY

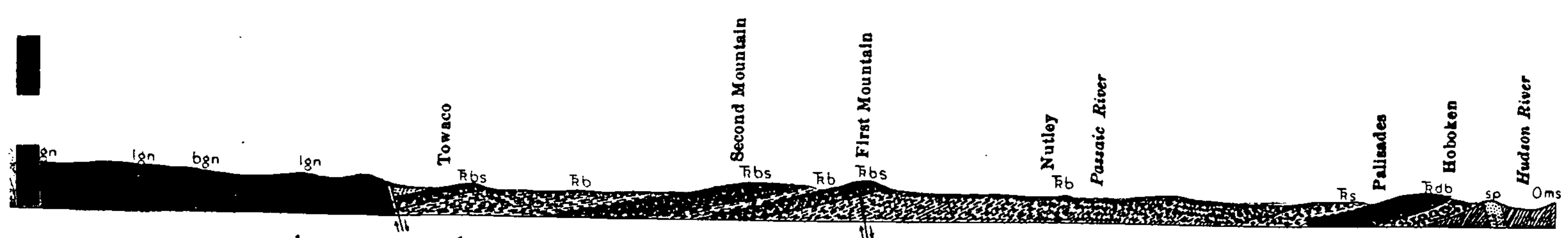
J. VOLNEY LEWIS AND HENRY B. KÜMMEL

1910-1912

REVISED BY H. B. KÜMMEL, 1931
AND MEREDITH E. JOHNSON, 1950

SCALE: 1:250,000 (approximately 4 miles to an inch)

4 3 2 1 0 4 8 12 Miles




en. Scales: Horizontal, 1/: Vertical 1/: Vertical

STATE OF NEW JERSEY

DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMEN

ATLAS SHEET No. 40

75°40′ 75°30′ 75°20′ 75°12′ 75°10′

41° 20′

# LEGEND

## SEDIMENTARY ROCKS

### TERTIARY

**Beacon Hill Gravel**
*Quartz gravel with some chert and sandstone pebbles.*

*(UNCONFORMITY?)*

Tch **Cohansey Sand**
*Chiefly quartz sand with local beds of clay and gravel. (Miocene or Pliocene)*

*(UNCONFORMITY)*

**Kirkwood Sand**
*Fine micaceous sands with local beds of dark clay. (Miocene)*

*(UNCONFORMITY)*

EOCENE

**Shark River Marl**
*Mixture of greensand (glauconite) and light colored earth, chiefly north of Asbury Park.*

**Manasquan Marl**
*Dark green glauconitic marl overlain by an ash-like mixture of fine quartz sand and grayish white clay.*

41° 10′

Tvt **Vincentown Sand**
*Glauconitic quartz sand alternating with beds of lime sand (coral fragments, etc.), the latter mostly consolidated.*

**Hornerstown Marl**
*Dark green glauconitic marl with varying amounts of quartz, fine earth, and clay. Marked shell bed at the top. South of Sykesville rests on Navesink marl below.*

*(UNCONFORMITY)*

### CRETACEOUS

**Red Bank and Tinton Sands**
*Coarse rusty sand, consolidated in places by iron oxide. In Monmouth County overlain by a bed of hard green clayey and sandy loam (Tinton).*
*The Red Bank is not found south of Sykesville, Burlington County.*

**Navesink Marl**
*Dark green glauconitic marl with shell bed at the base. South of Sykesville underlies the Hornerstown marl above.*

Kmw **Mount Laurel and Wenonah Sands**
*Coarse glauconitic sand (Mount Laurel) overlying fine micaceous sand (Wenonah).*

41° 00′

**Marshalltown Formation**
*Black sandy clay to clayey glauconitic marl.*

Ket **Englishtown Sand**
*White and yellow sand with little mica and glauconite and local thin layers of clay.*

**Woodbury Clay**
*Black to dove-colored clay, usually nonglauconitic.*

40° 56′

**Merchantville Clay**
*Black sandy clay, usually glauconitic.*

**Magothy and Raritan Formations**
*Dark lignitic sand and clay, containing some glauconite near the top (Magothy), overlying with slight unconformity variable sands and clays, chiefly light colored (Raritan).*

*(UNCONFORMITY)*

### TRIASSIC
### (NEWARK GROUP)

**Brunswick Formation**
*Soft red shale with sandstone beds, the latter more abundant toward the northeast; conglomerate beds (Trc) along northwestern border with quartzite or limestone pebbles in red matrix.*

40° 50′

**Lockatong Formation**
*Hard dark argillite with local thin beds of sandstone (flagstone); conglomerate beds (Trc) along northwestern border with quartzite or limestone pebbles in red matrix.*

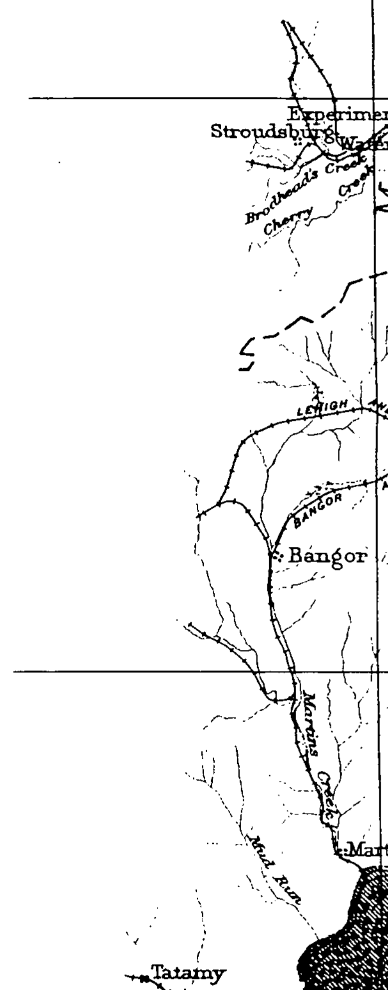
**Stockton Formation**
*Gray feldspathic sandstone (arkose), conglomerate, and red shale; conglomerate beds (Trc) along northwestern border with quartzite or limestone pebbles in red matrix.*

*(UNCONFORMITY)*

### DEVONIAN

Dsk **Skunnemunk Conglomerate**
*Coarse white quartz pebbles in purple-red matrix with frequent beds of red sandstone. (North central area).*

*NOTE—Zinc ore occurs in the Franklin limestone; magnetic iron ore in the Byram, Losee and Pochuck gneisses; workable ores of copper may occur in the Newark group; desirable building stone is obtained from the Losee and Byram gneisses, and sandstones of the Newark group; limestone suitable for flux and lime from the Franklin, Kittany, Jacksonburg, and the limestones in the upper Delaware Valley; for cement manufacture from the Franklin and Jacksonburg limestones; crushed stone for road metal and concrete chiefly from the basalt and diabase (trap) of the Newark group; clay chiefly from the Raritan, Magothy, Woodbury formations, some lenses in the Kirkwood and Cohansey, and some deposits of glacial origin; glass sand from the Cohansey; greensand marl from the Navesink, Hornerstown, Manasquan, and Shark River formation.*



Conglomerate of white quartz pebbles in hard bluish matrix, red toward the top, with beds of coarse hard sandstone.

*hard reddish-brown matrix, with beds of coarse hard sandstone.*

(UNCONFORMITY)

40°
28'

## ORDOVICIAN

Omb

**Martinsburg Shale ("Hudson River")**

*Black slaty shale (roofing slate in places) with thin beds of sandstone (flagstone), especially in upper parts.*

Oms

**Manhattan Schist**

*Mica schist with some gneiss (Jersey City and Hoboken).*

(UNCONFORMITY)

Ojb

**Jacksonburg Limestone ("Trenton")**

*Black or dark blue limestone often with limestone conglomerate at the base and limy shale ("cement rock") at the top.*

(UNCONFORMITY)

## CAMBRO-ORDOVICIAN

**"Kittatinny" Limestone**

*Upper—Thin and thick, gray or blue cherty magnesian limestone (Beekmantown); unconformity.*

*Middle—Light and dark, medium bedded limestones with cryptozoon heads (Upper Cambrian); unconformity.*

*Lower—Massive blue, blue-gray limestone with yellowish or silvery shale (Lower Cambrian). (South of Greenwood Lake includes a narrow band of Hardyston sandstone).*

40°
20'

## CAMBRIAN

**Hardyston Sandstone**

*Variable hard sandstone usually containing feldspar; local beds of conglomerate and slate. Includes small areas of Chickies quartzite at Trenton. (South of Greenwood Lake, a narrow band of Hardyston is combined on map with COk).*

(UNCONFORMITY)

## PRE-CAMBRIAN—METAMORPHIC

**Franklin Limestone**

*Coarse white marble, magnesian in part, containing graphite, chrondodite, pyrozene, and other minerals. Contains zinc ores in Sussex County. Includes some gneiss near Phillipsburg.*

# IGNEOUS ROCKS

## TRIASSIC

(NEWARK GROUP)

**Basalt Flows**

*Fine-grained trap rock in extensive flows, chiefly in the Watchung Mountains; in part vesicular.*

**Diabase**

*Coarse-grained trap rock, chiefly intrusive sheets in the Newark formations. Also dikes, a few basaltic (Ꝛbs).*

40°
10'

## POST-ORDOVICIAN

**Serpentine**

*From hydration of basic igneous rocks (Hoboken and Staten Island).*

ns

**Nephelite Syenite**

*Intrusive mass of gray coarse to fine-grained rock in Sussex County.*

bb

**Basic Volcanic Breccia**

*Numerous fragments of slate, limestone and gneiss inclosed in a matrix of basic lava (ouachitite) filling old volcanic necks (Sussex County).*

## PRE-CAMBRIAN

**Granite**

*Coarse-grained, rudely foliated hornblende granite, rich in zircon, titanite, and allanite (Northern border of Sussex County).*

**Gabbro**

*Including hypersthene gabbro and norite (about Trenton).*

**Losee Gneiss**

*White granitoid gneiss composed of oligoclase, quartz, and occasionally orthoclase, pyroxene, hornblende, and biotite.*

**Byram Gneiss**

*Gray granitoid gneiss composed of microcline, microperthite, quartz, hornblende or pyroxene, and sometimes mica. Includes small areas of Baltimore gneiss at Trenton.*

40°
00'

# METAMORPHIC ROCKS OF UNKNOWN ORIGIN

**Wissahickon Mica Gneiss**

*A banded quartz-feldspar rock with an excess of biotite (about Trenton).*

**Pochuck Gneiss**

*Dark granular gneiss composed of pyroxene, hornblende, oligoclase, and magnetite. Probably igneous in part.*

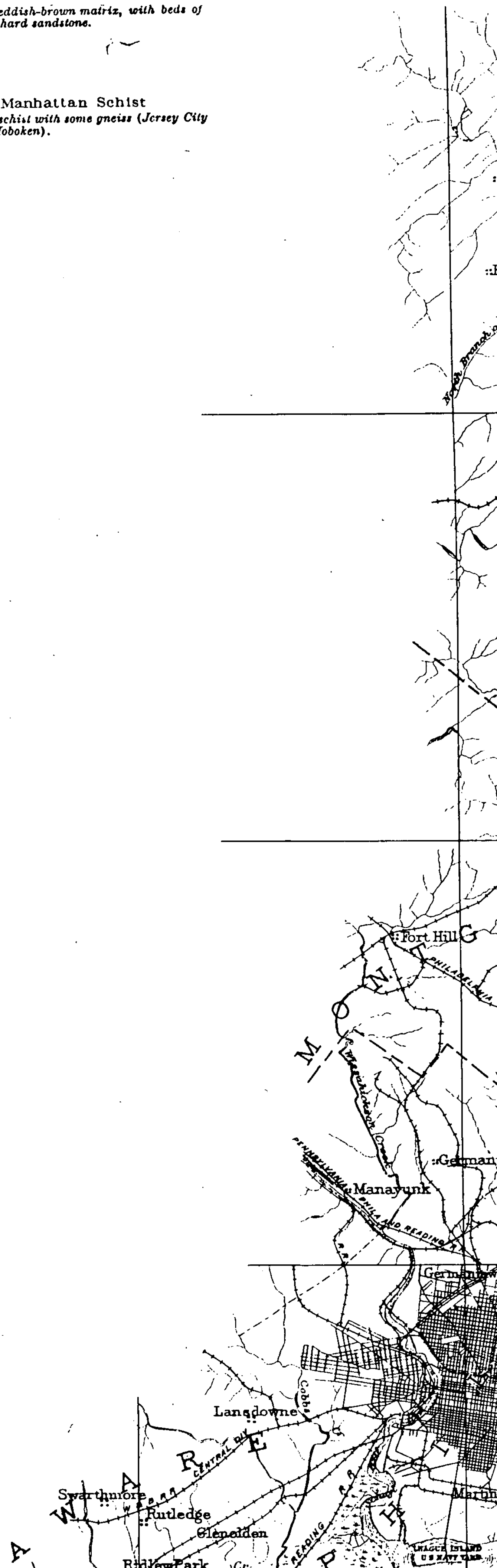
# UNKNOWN

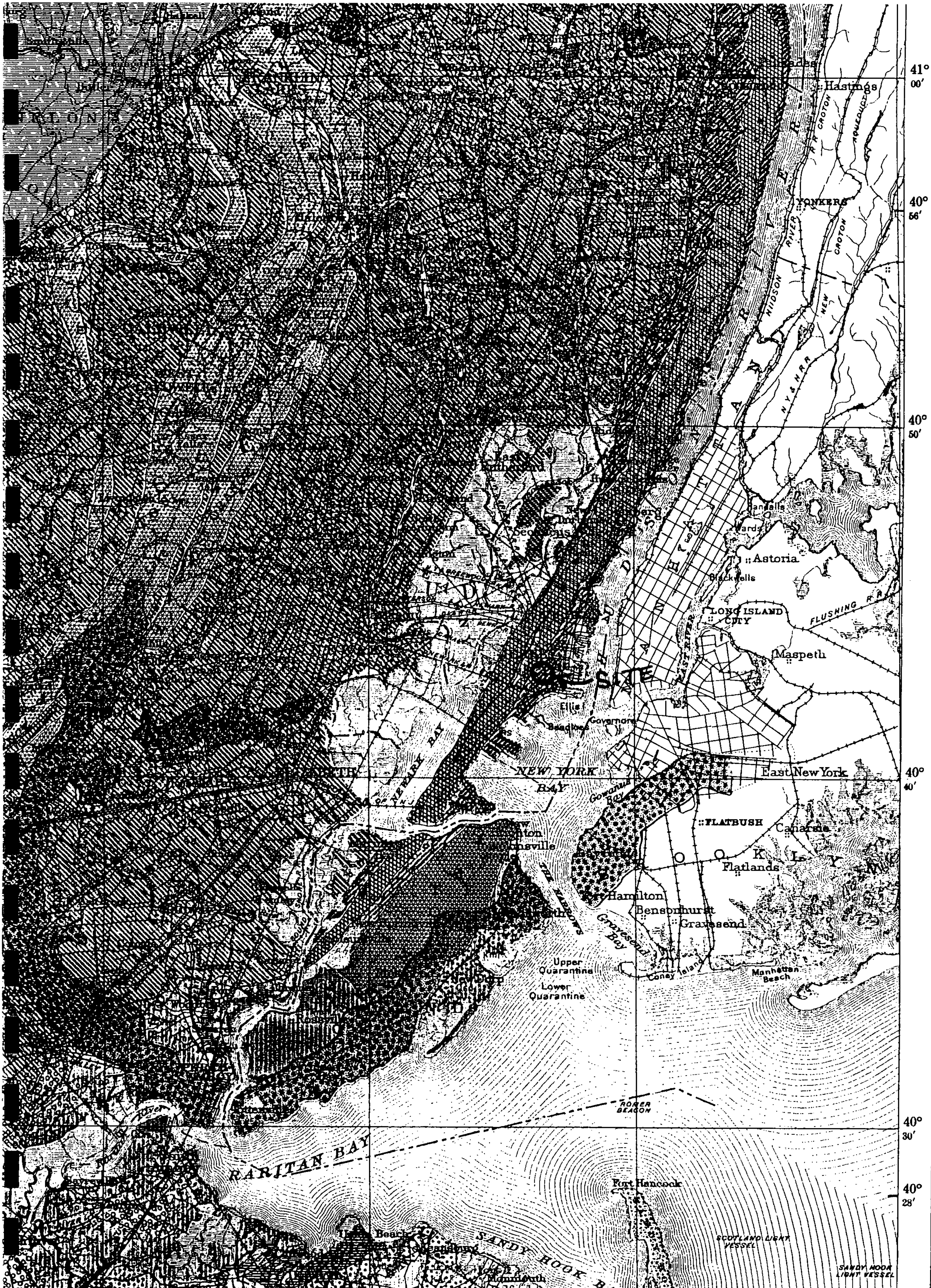
fnd

**Formation not determined**

*Drift cover thick and continuous; bed rock unknown.*

FAULTS





Hastings
41° 00'
YONKERS
40° 56'
HUDSON RIVER
N Y & H R R
NEW CROTON AQUEDUCT
40° 50'
Astoria
Blackwells
LONG ISLAND CITY
FLUSHING R R
Maspeth
Ellis
Governors
Bedloes
NEWARK BAY
NEW YORK BAY
Gowanus Bay
East New York
40° 40'
FLATBUSH
Canarsie
Flatlands
Hamilton
Bensonhurst
Gravesend
Gravesend Bay
THE NARROWS
Upper Quarantine
Lower Quarantine
Coney Island
Manhattan Beach
ROMER BEACON
40° 30'
RARITAN BAY
Fort Hancock
40° 28'
SCOTLAND LIGHT VESSEL
SANDY HOOK LIGHT VESSEL

REFERENCE NO. 12

26-23-326

Form [illegible]

Permit No. 26-581

Application No. ____

County ____

# DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT
## Division of Water Policy & Supply
# WELL RECORD

1. OWNER [illegible] Metals Corp. ADDRESS 380 Ninth Street, Jersey City, N.J.
   Owner's Well No. Test Well SURFACE ELEVATION ____ Feet (above mean sea level)

2. LOCATION Same as above.

3. DATE COMPLETED 12/9/52 DRILLER Artesian Well & Equipment Co., Inc.

4. DIAMETER: Top 8 Inches Bottom 8 Inches TOTAL DEPTH 99 Feet

5. CASING: Type Steel Diameter 6 Inches Length 99 Feet

6. SCREEN: Type ____ Size of Opening ____ Diameter ____ Inches Length ____ Feet
   Range in Depth { Top ____ Feet, Bottom ____ Feet } Geologic Formation ____
   Tail piece. Diameter ____ Inches Length ____ Feet

7. WELL FLOWS NATURALLY ____ Gallons per Minute at ____ Feet above surface
   Water rises to ____ Feet above surface

8. RECORD OF TEST: Date ____ Yield ____ Gallons per minute
   Static water level before pumping ____ Feet below surface
   Pumping level ____ feet below surface after ____ hours pumping
   Drawdown ____ Feet Specific Capacity ____ Gals. per min. per ft. of drawdown
   How Pumped ____ How measured ____
   Observed effect on nearby wells ____

9. PERMANENT PUMPING EQUIPMENT:
   Type ____ Capacity ____ Gallons per minute
   How Driven ____ Horse Power ____ R.P.M. ____
   Depth of pump in well ____ Feet Depth of Foot piece in well ____ Feet
   Depth of Air Line in well ____ Feet Type of Meter on Pump ____

10. USED FOR ____ AMOUNT { Average ____ Gallons Daily, Maximum ____ Gallons Daily }

11. QUALITY OF WATER ____ Sample: Yes ____ No. ____
    Taste ____ Odor ____ Color ____ Temperature ____ °F

12. LOG See Reverse Side. (Give details on back of sheet or on separate sheet) Are samples available? ____

13. SOURCE OF DATA ARTESIAN WELL & EQUIPMENT CO., INC.

14. DATA OBTAINED BY ARTESIAN WELL & EQUIPMENT CO. DATE December 16, 1952

(Note: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

0 - 3' Concrete, sand, fill.

3 - 63' Gray clay, soft.

63 - 64' Large and small gravel.

64 - 65' Gray clay, boulders.

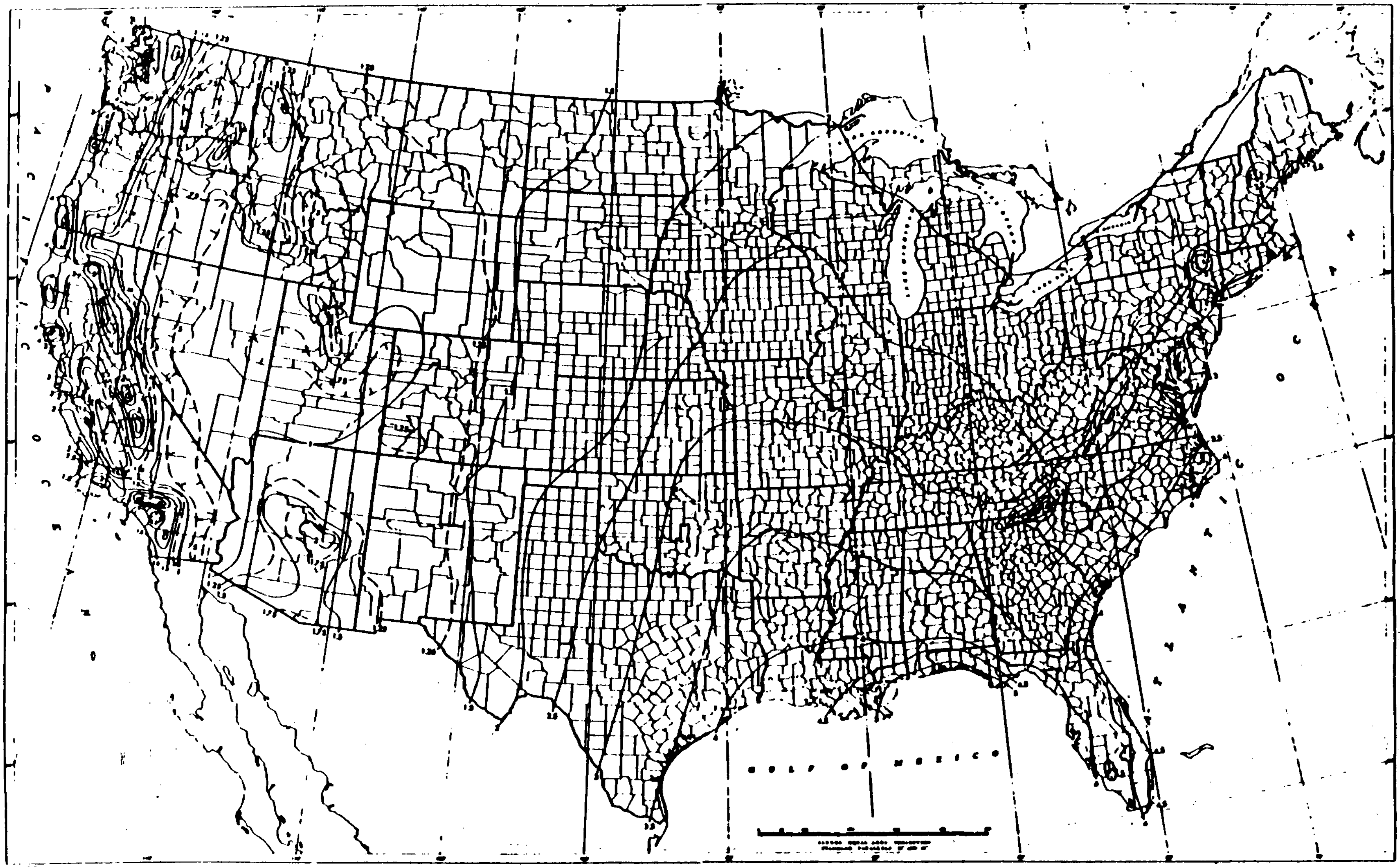
65 - 90' Red and grey clay, silty.

90 - 92' Gray clay, some sand and fine gravel.

92 - 95' Sand, some small gravel, clay.

95 - 99' Trap rock. ?

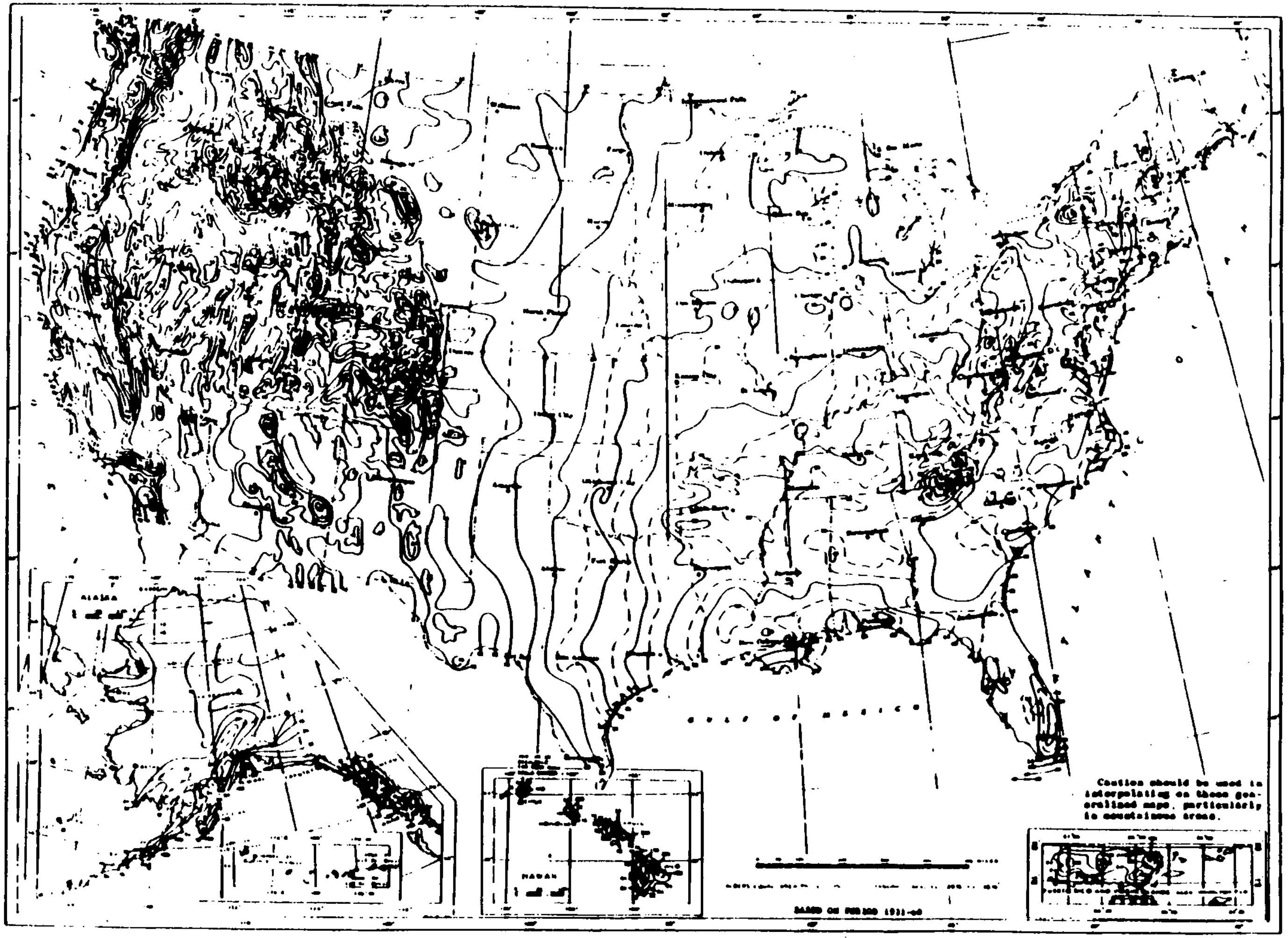
REFERENCE NO. 13




Source: Rainfall Frequency Atlas of the United States, Technical Paper No. 40, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1963.

**FIGURE 8**
**1-YEAR 24-HOUR RAINFALL**
**(INCHES)**

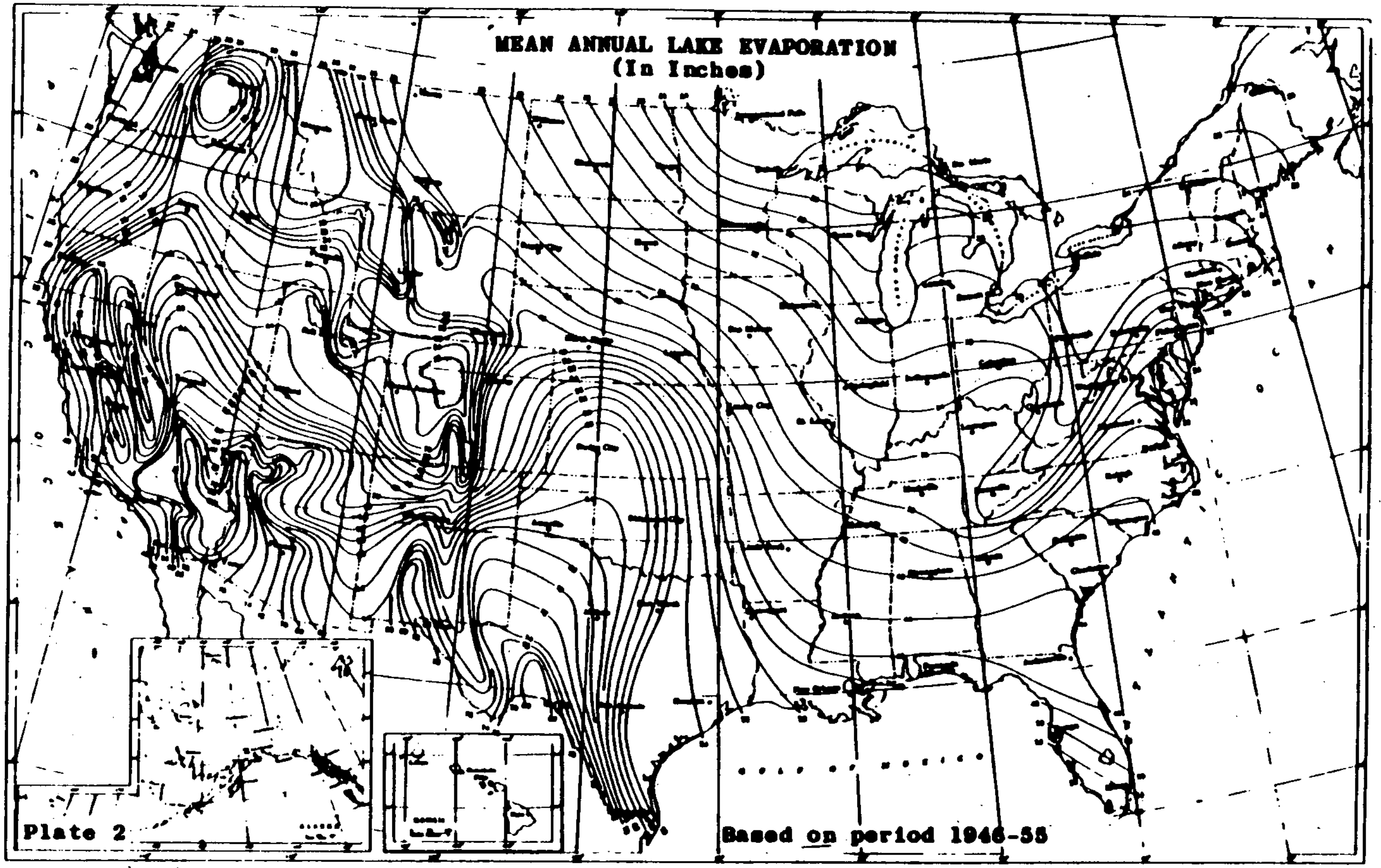
REFERENCE NO. 14




Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Asheville, N.C., 1979.

**FIGURE 5**
**NORMAL ANNUAL TOTAL PRECIPITATION (INCHES)**

REFERENCE NO. 15




Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Ashville, N.C., 1979.

**FIGURE 4**
**MEAN ANNUAL LAKE EVAPORATION**
**(IN INCHES)**